The IRON AGE
June 20, 1957
The National Metalworking Weekly

MID-YEAR CHECK ON METALWORKING: WHERE ARE WE HEADED?

Special Report – P. 51

Behind the Rise In Steel Scrap Prices – P. 55

Why Not Tumble Those Large Parts? – P. 91

Digest of the Week – P. 2-3

ARISTOLOY STEELS

LEADED STEELS LATEST INFORMATION

New 16-page booklet presents latest information on basic characteristics, mechanical properties and workability of Aristoloy Leaded Steels. Test results are supported by complete data and charts. Also contains several pages of case histories based on manufacturers' experience and documented by time study records, showing actual savings in reduced machining time and increased tool life.

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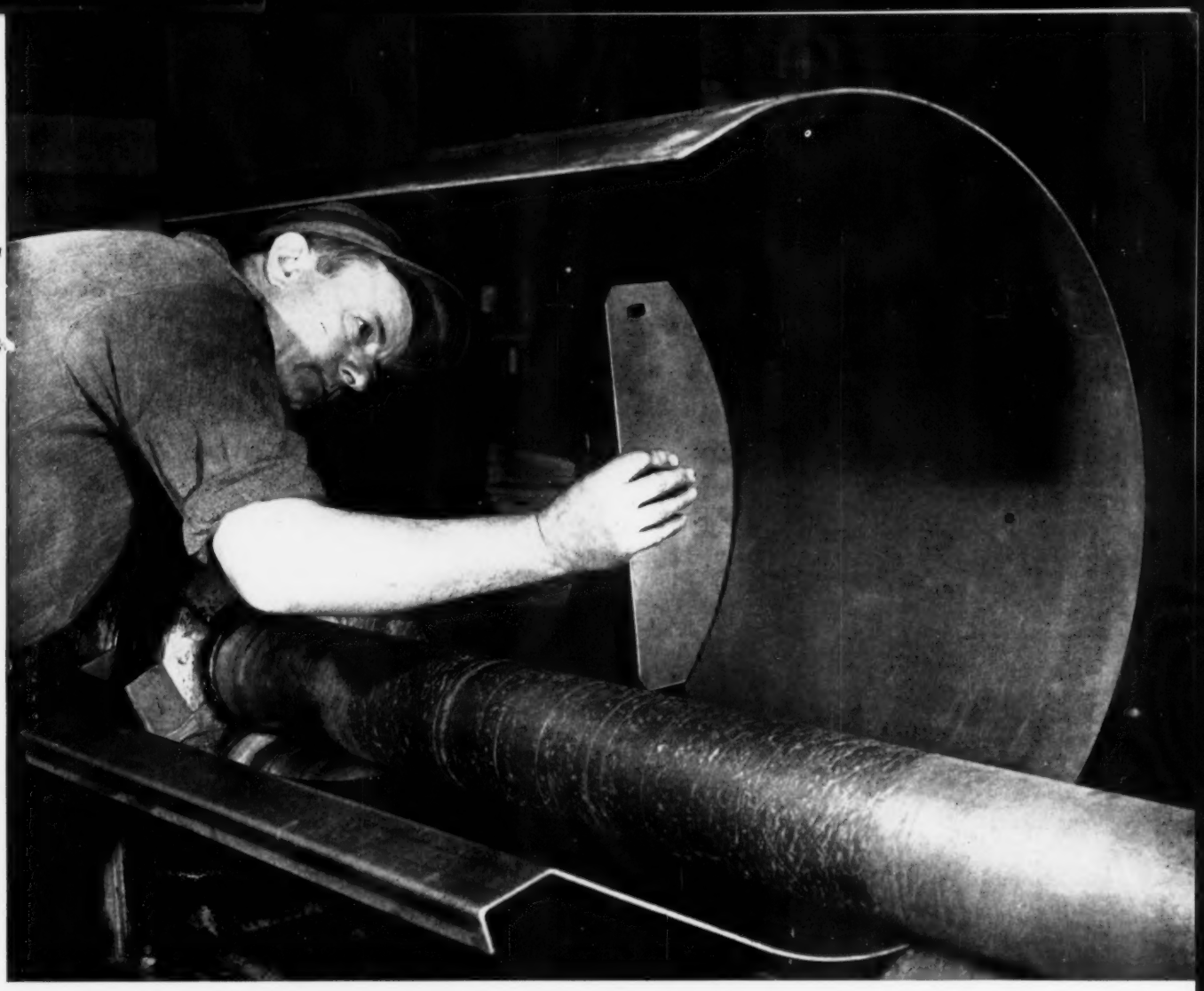

How Mayari R lengthened the life of these mixer drums

Mixing mortar or terrazzo in a machine like this one puts the steel mixing drum through quite an ordeal. In earlier models the abrasive action of the batch against the drum walls caused excessive wearing of ordinary carbon-steel drums.

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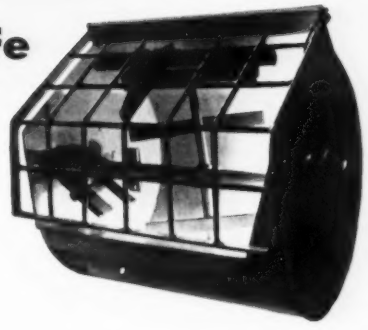
Catalog 353 covers the Mayari R subject in complete detail. A copy may be obtained promptly by writing to the nearest Bethlehem office.



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Mayari R...High-Strength, Corrosion-Resisting Steel

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The IRON AGE

JUNE 20, 1957—Vol. 179, No. 25

Digest of the Week in

*Starred items are digested at right.

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NEWS ARTICLES

Behind Scrap's Unexpected Price Surge

Most of the trade had expected scrap prices to stay down through

the summer months. Here's why, for the second time in six months, this market goes haywire. P. 55

Steel Labor Tackles Small Firms

Steel union locals will be busy this year drawing up contracts with 1200 small metalworking firms. Labor is shooting for two-year contracts and more benefits. P. 56

Will Government Back Industry Loans?

A group of senators is proposing a new mobilization loan plan to replace the once-broad tax amortization program. Arguments for it are strong. But reception by the White House and ODM is cool. P. 58

Hard Money Policy Will Stay Under New Treasury Boss

Humphrey's successor will con-

Metalworking

CHECK YOUR MARKET: A top-to-bottom check by IRON AGE editors reveals how business is going for metalworking companies and what the outlook is for the last half. A roundup of sales, inventories, and financing will help you make important decisions. **P. 51**

tinue direction of the Administration's united front against cheap money. Democrats, seeing political opportunity, mount an attack against costly credit. **P. 73**

Shortage of Electric Power May Slow Northwest

Fast paced industrial activity is putting a strain on Washington State's available power supply. What's needed for future industrial growth is development of more local, low-cost power sources. **P. 75**

FEATURE ARTICLES

Why Not Tumble Large Parts?

When you think of barrel finishing it usually brings to mind small parts. But actually there appears to be no definite limit to size of workpiece. The tumbling technique turns out to do a fine cost-cutting job on the big ones. **P. 91**

Boron Solves "Hot Shortness" In Stainless Steels

The hot-working performance of austenitic stainless steels increases markedly with addition of just a tiny bit of boron. Laboratory tests show the benefits. Sometimes the degree of improvement is 100 pct or more. **P. 95**

In Minutes New Furnace Heats to 6000°F

Amazing as it may seem, the new furnace will do just that. Designed and developed in Germany, it heats to more than 6000 F in six minutes. It's soon to be in production in the United States. **P. 98**

Double Cutting Boosts Planing Rate

Speeding up the return stroke on conventional planers can only go so far. But use return stroke for cutting and you get maximum cutting efficiency. New tricks add to advantages of two-way cutting. **P. 100**

Castings Machine Better With Water Coolants

Wet machining techniques pay off. They keep dust out of the air. Chip disposal is easy. Tool costs go down. And extensive use reduces coolant cost. Chrysler gets these dividends. **P. 102**

MARKETS & PRICES

Nickel Output Expansion May Hinge on U. S. Aid

International Nickel and Bethlehem — interested in developing nickel deposits—seek guarantees of government aid on the projects. One proposal asks assurance that excess output will go to stockpile. **P. 59**

Dairy Farmers Using More Stainless Steel

Swing to stainless milk holding tanks provides a big, growing market for mills. Drive is on to sell dairies on 200 Series. **P. 60**

Will General Motors Miss The Boat in 1958?

It's a safe bet GM will battle hard to regain sales prestige lost to Ford and Chrysler this year. An expensive crash retooling program is underway. Chevrolet and Chrysler will be all-new. **P. 68**

Military Opinions Differ On Tool Leasing

ODM is pushing for a uniform method of leasing government machine tools to industry. Key to the program is cash rental, but military favors discount on price of items made with U. S. tools. **P. 77**

Look For a Steel Upsurge In Fourth Quarter

Steel demand will pick up in the fourth quarter. The summer lull will be followed by an upsurge as steel-using industries catch their second wind.

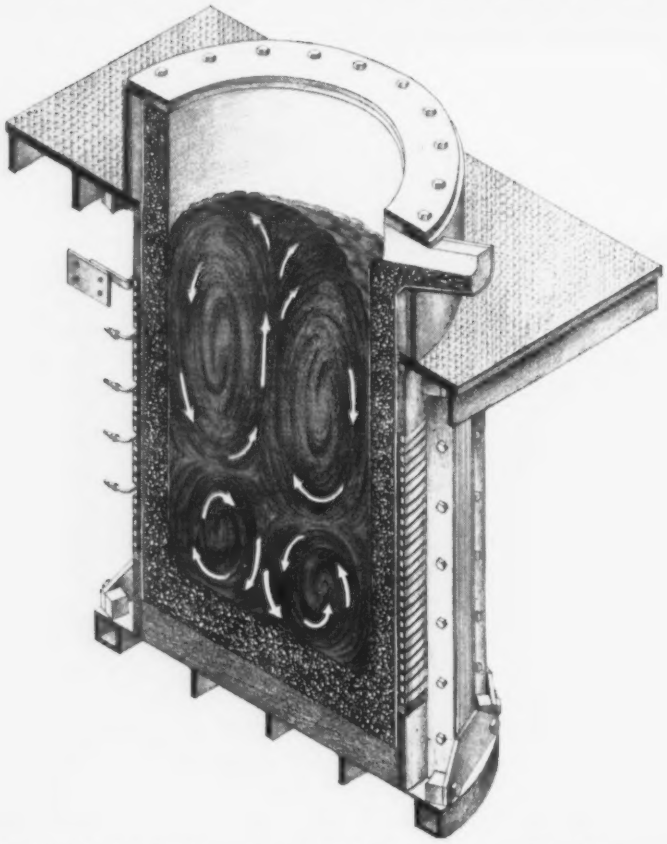
NEXT WEEK

A Guide for Choosing Executive Talent

The problems metalworking companies meet in selecting executive talent will be thoroughly hashed over in Next Week's special report. Backing it up is a survey by the National Industrial Conference Board.

AJAX-JUNKER

a new principle in 60 Cycle induction melting



WHAT IT IS:

- A cylindrical induction coil supplied with ordinary 60 cycle current induces heat and vigorous electromagnetic stirring in the molten metal charge.

  Integrated electric controls regulate power, maintain high power factor automatically.

  Monolithic refractory linings are made by ramming against the sturdy water-cooled coil held in a rigid frame of magnetic and structural steel.

  This new principle was perfected in Europe over the last seven years. Over 100 Junker furnaces are now in use. AJAX-JUNKER designs are based on latest experience, using American components and practices throughout.

WHAT IT CAN DO:

- Outstanding results are proven in these fields:

  DUCTILE and ALLOY IRON CASTINGS
  RECOVERY OF IRON TURNINGS
  RECOVERY OF ALUMINUM SCRAP

  Available sizes range from 1 to 10 tons, with normal melting cycles from 2 to 4 hours. Power ratings are 200 kw through 1500 kw.

May We Explore the Possibilities of this New Method with You?

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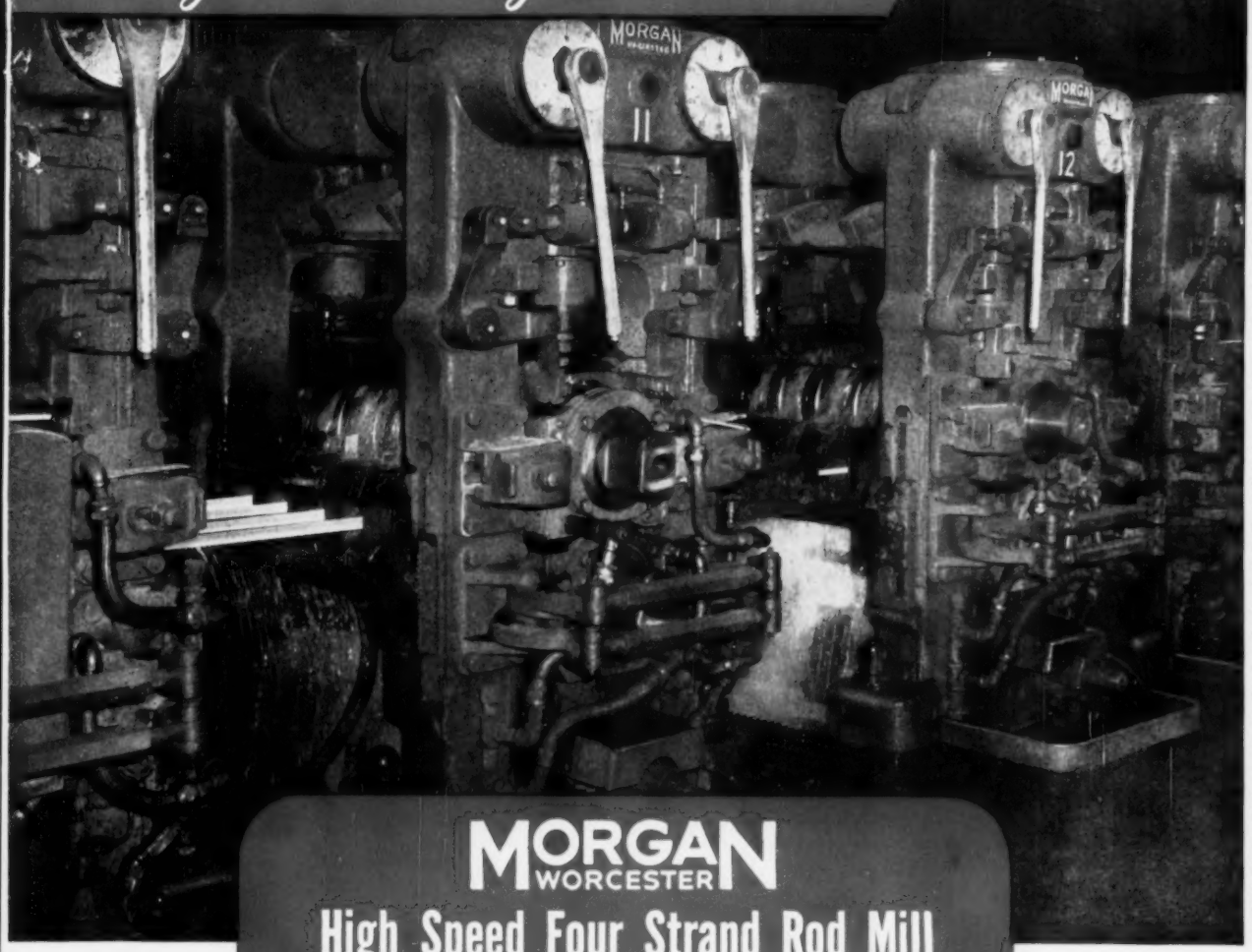
ENGINEERING CORPORATION

TRENTON 7, NEW JERSEY

Associated Companies: Ajax Electrothermic Corporation Ajax Electric Company

Morgan Quality in Action



MORGAN WORCESTER

High Speed Four Strand Rod Mill

Cuyahoga Works, American Steel and Wire Division
UNITED STATES STEEL CORPORATION

Morgan Mills are known to steel men throughout the world for their sound design and accurate manufacture . . . an enviable reputation which has assured mill users of efficient and trouble-free operation. Morgan Mills have kept pace with the ever-increasing demands for high output and greater accuracy of product.

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ROLLING MILLS MORGOIL BEARINGS GAS PRODUCERS
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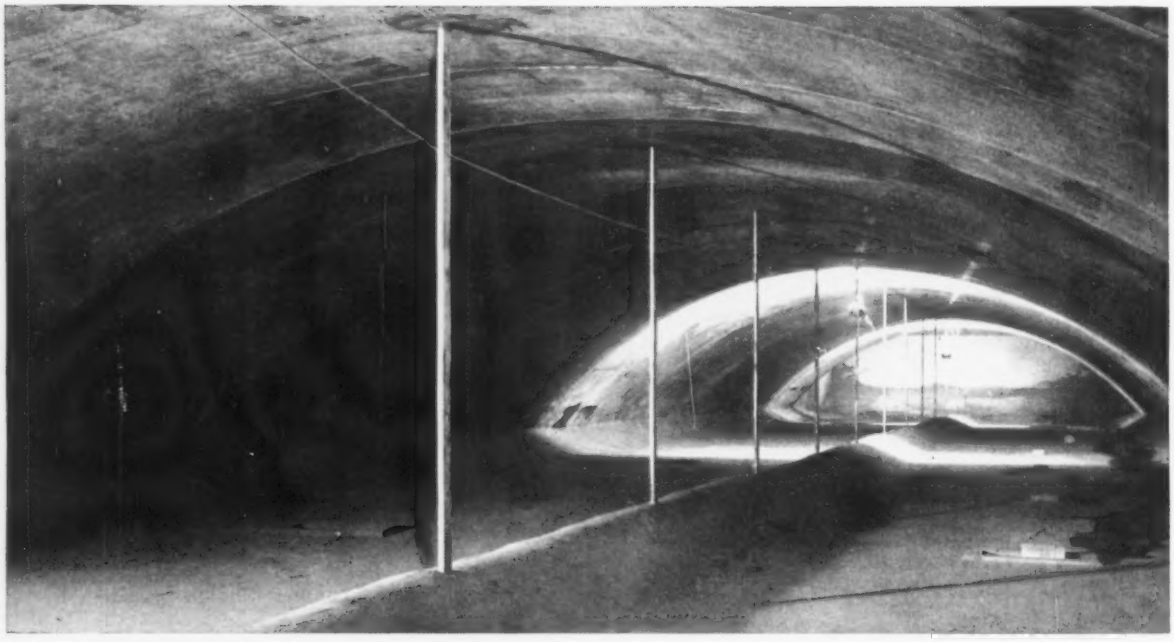
RM-70

MORGAN WORCESTER



Drivers below won't see this huge air duct. Its job is to carry away exhaust gases. Strong, corrosion-resistant Armco Stainless Steel bars suspend the "floor" of the duct.

Tunnel Contractor: Merritt-Chapman & Scott Corporation

How Armco Stainless Steel Bars Will Help a Tunnel Breathe

Traffic will soon be routed through the mammoth new twin-tube expressway tunnel now being laid beneath Baltimore Harbor. Motorists who drive through it must have pure air to breathe . . . so the tunnel must breathe too!

Fresh air, inhaled into the "respiratory system" of the giant twin tubes, will enter below the roadways. Dangerous exhaust gases will be exhaled into exhaust air ducts that serve as the tunnel ceilings.

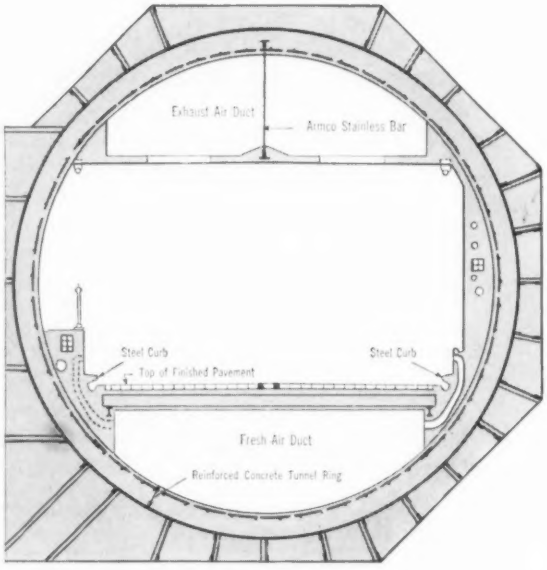
Suspending these ceilings will be Armco Stainless Steel, Type 302 bars. Though relatively thin ($\frac{3}{4}$" x $\frac{31}{2}$") to cut down resistance to exhaust air flow, they have the strength required to hold up the tons of material that make up the ceilings (the duct floors). But these Armco Stainless bars provide more than strength. They also will resist corrosion from moisture and exhaust gases—assure long service life in a location where minimum maintenance is a *must*.

MANY GRADES, FORMS, SIZES

Armco produces a wide range of standard and special stainless steels, in billet, bar, wire, sheet, strip and plate . . . many sizes, shapes and finishes. They serve in an infinite variety of applications.

Complete information about Armco Stainless Steels is readily available.

Just call the Armco Sales Office nearest you, or write us at the address below.



Here's one tunnel tube in cross-section.

ARMCO STEEL CORPORATION

1627 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Red Chinese Trade— Who Will Gain By It?

Great Britain's move to expand trade with Red China was no surprise. At least it wasn't too unexpected. But it would be unexpected—and wrong—for us to follow suit.

More and more people in the United States profess to see no harm in treating the Red Chinese as we treat the Russians. They argue that we should use the same non-strategic list and ditch the embargo.

That doesn't make too much sense. Two wrongs don't make a right. Maybe we should not trade with the Russians at all.

The Reds want trade with the free world to get things they don't have. They hope to obtain the "have not" items so they can build a much stronger industrial (and war) machine.

From the standpoint of Great Britain and other European nations, the trading question might look different. Those countries need trade to exist. If we don't import enough, then they must go elsewhere. Even so, it isn't that simple.

The Red Chinese have insulted Britain right and left in the past. This latest move was probably the result of pressure from business people who wanted to sell to the Red Chinese on the same basis as they are selling to the Russians.

So-called non-strategic lists are also misleading. Materials that would aid in military or war projects are not supposed to be traded but that isn't the whole story.

Shipments of "borderline items" free Russian—and now Red Chinese—factories so they can speed up war materiel output if they want to. Increased trade also makes both Red nations stronger and capable of carrying on world domination trends.

But Great Britain and others have the right to trade with whom they please. If we keep exporting more than we import we have no right to get huffy about their trade policies. Whether or not Britain will find out that the advantages to her trade are a mere pittance compared with the dismal time the Chinese Reds will give her is her business.

But get back to us. There is no earthly reason for us to trade with Red China. What good would it do us? None! It is ridiculous to believe that trade always brings peace. Sometimes it brings war. Our trading with the Red Chinese won't make them love us any more than they do now—so why trade with them? Why help them to get in a position to hurt us?

It is as simple as that. And if someone tells you differently just ask him, "Who would gain by our trading with the Red Chinese?"

Tom Campbell

Editor-in-Chief

NEW YORK WORLD-TELEGRAM AND SUN, THURSDAY, AUGUST 9, 1956
Phoenix Raises a Big Roof
Also RUSTLESS thanks to ZINC!
Trussless Steel Giant
The erection of the world's largest trussless steel roof, a clear span 120 feet wide and 200 feet long, over the new $750,000 Phoenix Coliseum under construction in Phoenix, Ariz., was announced today by the Wonder Building Corp. of America.
Called the "Wonder Roof," it is the first in a new line of low-cost, long-span custom-engineered roof decks being marketed by the firm for convention halls, arenas, etc. Costs are said to be one-third less than conventional roof structures.
At the Phoenix Coliseum the unique roof was completely erected in seven and one-half days.
CURVED SHEETS of corrugated steel are fastened together by nuts and bolts to form the self-supporting arches which make up the new trussless steel roof. Workmen above assemble pre-engineered sections.

Reprinted by permission of the New York World-Telegram & Sun

Two design features of the roof* of the new Coliseum in Phoenix, Arizona are somewhat unique.

1 . . . the roof is TRUSSLESS, thanks to the use of specially designed curved steel sheets, so assembled as to form a strong, self-supporting arch.

2 . . . the roof is RUSTLESS, thanks to ZINC.

Yes, the roof is galvanized and by the continuous galvanizing process, too, which produces a much better coating . . . a coating that adheres more strongly to the steel and which permits severe forming operations without damage. With this coating the metal appears to 'flow' with the base metal when being shaped.

BUT . . . and this is where St. Joe Electrothermic Zinc enters the picture . . . continuous galvanizing calls for zinc with specially controlled analyses of the other metals. It isn't a question of staying within permissible maximums. It's a question of keeping the other metals within certain specified ranges in order to impart certain desirable characteristics to the zinc and the coating.

St. Joe Electrothermic Zinc is this carefully controlled zinc. It's ideal for continuous galvanizing.

ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK 17, NEW YORK

*Designed, fabricated and installed by Wonder Building Corporation of America, Chicago, Ill.

HIGH GRADE
INTERMEDIATE
PRIME WESTERN

ST. JOE *electrothermic* **ZINC**

LETTERS FROM READERS

Labor Relations

Sir—We are very much impressed with the results of your survey incorporated in your May 23 Survey Report to Management, "How To Build Good Labor Relations."

You have supplied management with a valuable package of "know how." Extend our sincere compliments to your staff for a job well done! — E. Blanchard, Director, Personnel and Public Relations, Locke Mfg. Co., Lodi, Ohio.

Depreciation

Sir—May we have 125 reprints of No. 11 in your Modern Management Series, "Let's Make Sense in Our Depreciation Policies?"

This is the best dissertation on the subject we have seen.—J. C. Sears, Exec. Secy., American Gear Manufacturers Assoc., Washington, D. C.

▪ Copies are on the way.—Ed.

Budget Cutting

Sir—In your May 30 editorial, "Budget-Cutting Time — Everyone Must Do His Part," as inserted by Representative William M. Colmer in the Congressional Record of June 3, you end on this sentence: "Let's fish or cut bait: Either we want less government spending and will give up our pets or we don't. It calls for basic honesty."

May I suggest that the basic honesty called for is that inherent in a redeemable currency, the only honest and honorable currency known to man. The government took unrestrainable control of the people's purse when it thrust an irredeemable currency on them in early 1933.

The government's spending orgy since, the excessively heavy taxation, the great growth of debt, the rise in prices, the march into Socialism were all permitted and invited by the use of the drug of irredeemable currency. Since the people embrace that drug, once they are given a taste of it, they tend, along with their government, to work toward their ultimate distress.

The starting point in arresting the bad practices in which we are now engaged is the institution of a redeemable currency. After that solid foundation has been laid, proper steps should then be taken to institute correct procedures in the areas of credit control and fiscal management.—W. E. Spahr, Exec. Vice Pres., Economists' National Committee on Monetary Policy, New York.

Stamping

Sir—The special feature, "How to Get More for Your Stamping Dollar," in your May 30 issue is outstandingly good. It is simple and concise and has a great deal of useful information contained in it.

There are a number of engineers in our organization who will find this article of great use to them in their everyday work.—A. B. Newton, Vice Pres., Design and Research, The Coleman Co., Inc., Wichita, Kan.

"When I asked him for a raise, he pulled one of those trick questions. He asked me to give him one good reason."

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Check These Features and You'll Want a

DI-ACRO* POWERSHEAR

PRECISION—strips less than .025" wide accurately sheared, thousands of parts exactly duplicated.

CUTTING SPEED—ranges from 30 to 200 S.P.M. on Vari-O-Speed models—continuous or single stroke operation.

RATED CAPACITY—16 gauge steel.

EASY TO OPERATE—a woman can operate it.

CHOICE OF MACHINE—two Vari-O-Speed models. Also two Standard Models running at set speeds.

MINIMUM OPERATOR FATIGUE—especially designed for use where a high rate of production must be maintained.

ENGINEERING SERVICE—always at your disposal.

RUGGEDLY BUILT—backed by one year warranty.

DELIVERY—immediate on most models.

COST—that's good too.

*pronounced Die-ack-ro.

METALS RUBBER MICA FIBRE PLASTIC LEATHER SCREEN MESH

SEND FOR CATALOG

Gives full details on both hand and power operated Di-Acro Shears, Benders, Brakes, Rod Parters, Notchers, Rollers and Punch Presses.

Creators of "Die-Less Duplicating"

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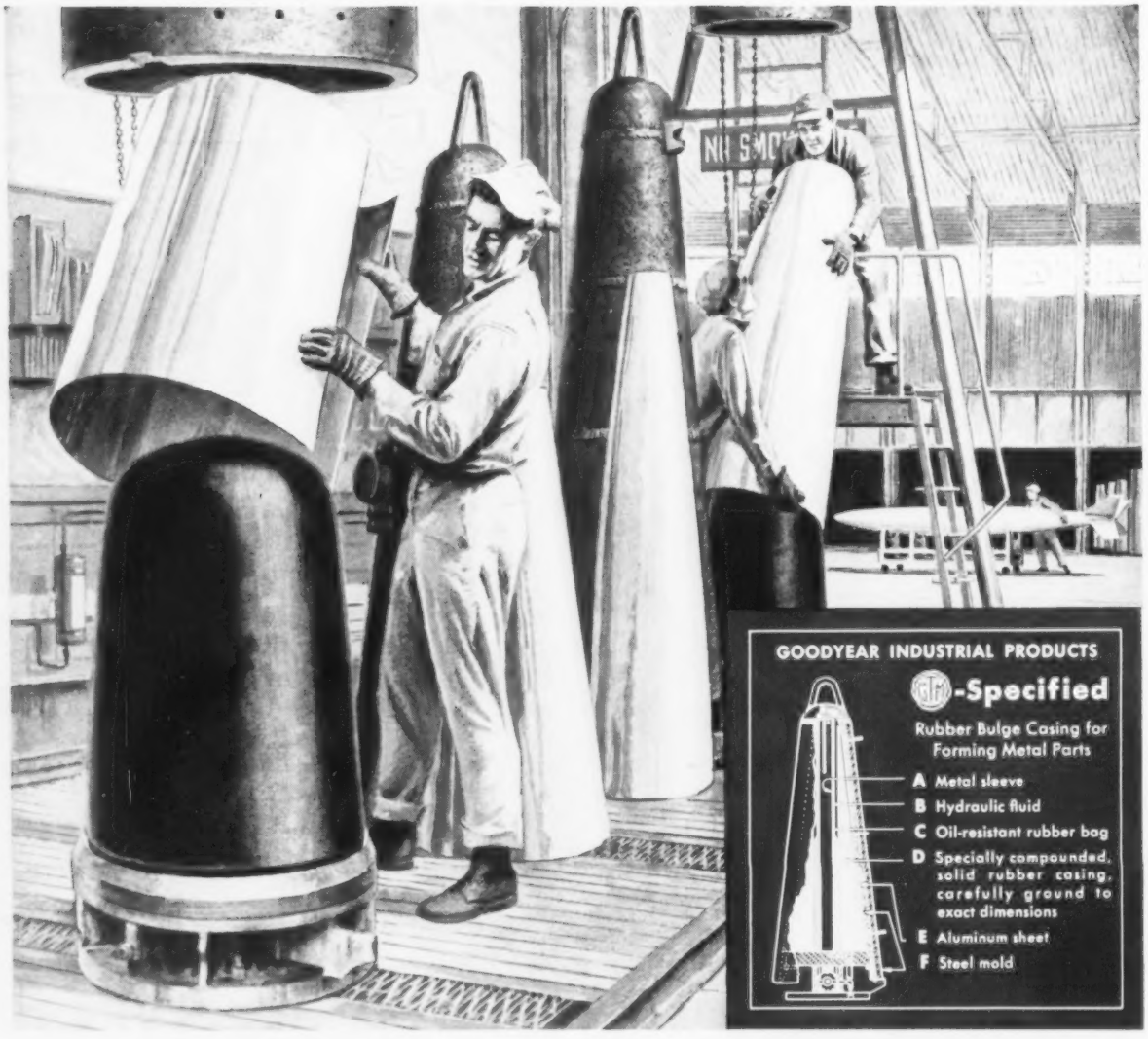
di-acro PRECISION METALWORKING MACHINES


GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Rubber Bulge Casing for Forming Metal Parts
A Metal sleeve
B Hydraulic fluid
C Oil-resistant rubber bag
D Specially compounded, solid rubber casing, carefully ground to exact dimensions
E Aluminum sheet
F Steel mold

A new "form" of profit!

Fuel tanks for jet fighters are produced faster and cheaper by the new process pictured above. It's the development of a Midwestern manufacturer and employs rubber "bulge casings"—expanded by hydraulic pressure—to form the tank sections against metal molds.

But the first bulge casings—made of rubber strips bonded together—broke apart after only 30 to 40 units had been formed. Repairs were difficult—didn't last. Finally they called in the G.T.M.—Goodyear Technical Man.

He soon had the answer. Calling on his experience with rubber-covered rolls, he came up with a special one-piece rubber casing with no seams to separate. And the rubber was especially compounded to withstand constant flexing. Result: At last report the G.T.M.'s casing had turned out *over 500 units without slightest sign of wear.*

Breaking through bottlenecks like this one—with special or standard industrial rubber products—is routine to the G.T.M. To turn his problem-solving ability loose on your tie-ups, just write

Goodyear, Industrial Products Division,
Akron 16, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

FATIGUE CRACKS

Pulsetakers!

Where does metalworking stand at midyear? And how will it fare in the next six months?

Editor George Sullivan tossed these questions at his eager-beaver news staff a few weeks back. And, with a flick of the eyebrow indicated he would like to have some answers before the year was very much farther along.

Now any good reporter knows that the only way to get answers is to ask questions. So IRON AGE editors from coast-to-coast were

Editors at work

turned loose with instructions to check and doublecheck the companies that make things out of metal. They also checked the oil country and construction people, as well as Government sources.

We must admit our editors went about their tasks with typical reportorial diligence. It was real heart-warming to see those reports flowing in from all over the country. (See cut.) Editor Sullivan's eyes fairly glowed with appreciation as he mentally translated his staff's efforts into a readable story.

You'll find this readable story, complete with layout, beginning on page 51 in this issue. It's a must for the metalworking executive who's laying out his own plans for the next six months.

So Big?

All right, how large a part would you venture to put in a tumbling barrel for precision finishing? Something weighing half a pound, perhaps—or maybe two or three pounds in an extreme case?

It may interest you to know that 1000-lb jet rotors are tumble-finished successfully and economically. So are a lot of other big, heavy metal parts.

There's no reason why you can't barrel finish some of your own heavy workpieces to avoid the high cost of finishing them by hand. The first thing you'll need is a big enough barrel. And the illuminating article on p. 91 will show you many ways to use it.

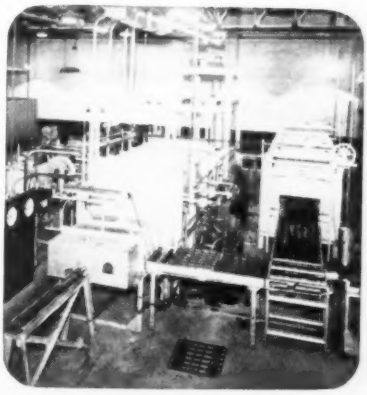
Puzzlers

Here are a couple of answers.

Mr. Simpson knew that child's name because the friend whom he met was a woman whose name was Margaret. Thanks to Myrna D. Geensburg, American Nickel Alloy Manufacturing Corp., Norma J. Schweig, of University City, Lee E. Holcomb, Crawford & Doherty Foundry Co., T. Granahan, Wilkes-Barre Iron & Wire Works, Inc., for correct answers.

The murderer was a man who had been hurt by Mr. Jones, the reckless driver. His legs had been amputated as the result of the injury, and as a beggar-vender of pencils he got about on roller skate wheels. He waited till the car drove in, followed and revenged himself by shooting Mr. Jones as he stepped out. Lou Wolff & Myrna Geensburg, American Nickel Alloy Manufacturing Corp., Lee S. Rudd, Virginia Steel Co., Inc., Ed Blair & Bob Simons, Philco Corp., Perry McClure, Manning, Maxwell & Moore, Inc., and Elinor Jones, Ford Motor Co. all agree.

LABOR SAVED 50%
PRODUCTION UP 50%



R-S . . .
CONTINUOUS HARDENING, QUENCHING, DEGREASING, DRAWING LINE

It's one operation instead of four to heat treat cylinder liners at Continental Motors with the R-S equipment. Electric heat treating line is one complete unit . . . temperature is 1575° F. for hardening, it is oil quenched and the draw furnace operates at 1100° F. The atmosphere is controlled through hardening and quenching operations and capacity is 1,300 gross lbs. per hour.

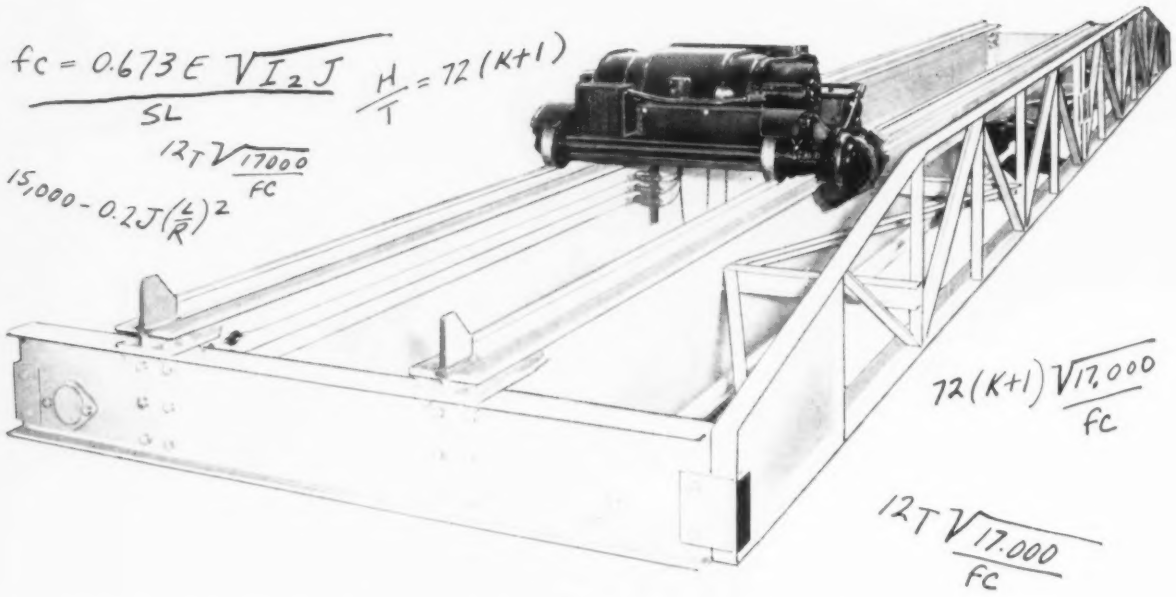
R-S Heat Treating unit requires only two men instead of four with the conventional type. Production rate is up 50% . . . quality is uniformly high . . . and the unit paid for itself in 22 months.

Why not put these savings into your heat treating? Write today for your copy of the booklet on better heat treating. Ask for R-S 200. No obligation.

R-S FURNACE CO., INC.
Philadelphia 44, Pa.

Car Hearth Furnaces
Continuous Furnaces
Rotary Type Furnaces

R-S FURNACES



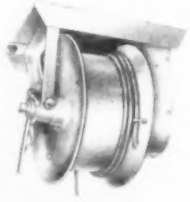
GET THE **LOW-COST CRANE** YOU WANT WITHOUT A LOT OF FUSS AND FIGURING

Here's an easy way to buy an electric crane of 1 to 20 tons' capacity. Ask for a copy of Catalog 221. In it you will find the complete line of Series "D" 'Load Lifter' Cranes for average industrial service. So simply and thoroughly are the facts presented that you can choose exactly what you want. Capacities, trolley types, lifts, spans — every specification detail you must know is clearly stated. No complicated figuring. No costly special engineering.

Series "D" 'Load Lifter' Cranes are highly standardized and mass produced to save you money. Yet every capacity has engineering advantages and features found only on the most expensive cranes. For example, every moving part that should operate in oil *does* operate in oil — in sealed housings — for long-lasting performance. Every bearing is either a ball or roller bearing for smooth efficiency. The bridge and trolley wheels are on rotating axles with anti-friction bearings. Push buttons energize variable speed magnetic controllers on the floor-operated cranes. Master switches are provided on cranes equipped with operator's cage. Structural design and strength are so well engineered, whipping and skewing are eliminated. Complete safety for man, load and crane are assured.

Whatever your needs in a 1 to 20-ton overhead electric traveling crane for average industrial service, save time, trouble and money. Get a copy of Catalog 221 and order the crane that best meets all your requirements.

INSUL-8-BAR CONDUCTOR SYSTEM. A low-cost, flexible system. Enclosed, insulated. Always dependable, indoors or out. Assures complete safety, higher plant efficiency, lower maintenance costs. Trolleys are shoe type. Easy, fast and inexpensive to install, with simple tools. Ask for Bulletin M83.



"SHAW-BOX" CABLE REEL. Constructed to eliminate spring breakage. Automatically keeps insulated conductor cable taut. Used on crane and hoist magnets, on soaking pit carriages, rolling mill machinery, machine tools. Available with 50 and 90 lb. pull; drums to wind up to 120 ft. of cable. Ask for Bulletin 368.

'Load Lifter'® CRANES

57D-7

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MANNING, MAXWELL & MOORE, INC.
SHAW-BOX CRANE & HOIST DIVISION
382 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.*

EXHIBITS, MEETINGS

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22.)

Metal Show — Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

JUNE

American Institute of Chemical Engineers — 50th anniversary meeting, June 22-27, Bellevue-Stratford Hotel, Philadelphia. Society headquarters, 25 W. 45th St., New York.

Alloy Casting Institute — Annual meeting, June 23-25. The Homestead, Hot Springs, Va. Society headquarters, 32 Third Ave., Mineola, N. Y.

Wire Reinforcement Institute — Annual spring meeting, June 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters 1049 National Press Bldg., Washington, D. C.

Concrete Reinforcing Steel Institute—Annual meeting, June 24-29, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 38 S. Dearborn St., Chicago.

SEPTEMBER

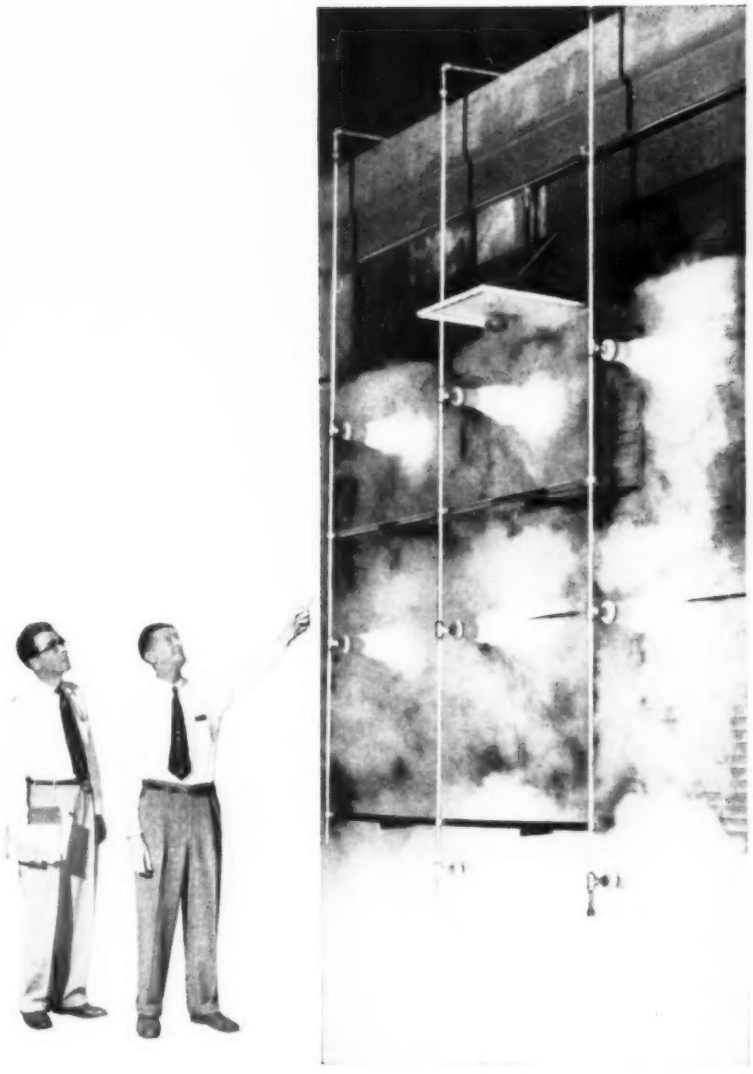
American Mining Congress—Metal mining and industrial minerals convention, Sept. 9-11, Hotels Utah & Newhouse, Salt Lake City, Utah. Society headquarters, 1200 18th St., Washington, D. C.

Instrument Society of America — 12th annual instrument-automation conference and exhibit, Sept. 9-13, Cleveland Auditorium, Cleveland. Society headquarters, 313 Sixth Ave., Pittsburgh.

National Petroleum Assn.—Annual meeting, Sept. 11-13, Traymore Hotel, Atlantic City. Society headquarters, 958 Munsey Bldg., Washington.

Marking Device Assn. — National meeting, Sept. 19-20, Roosevelt

(Continued on P. 16)



Stop Oil Bath Air Filter Fires Fast!

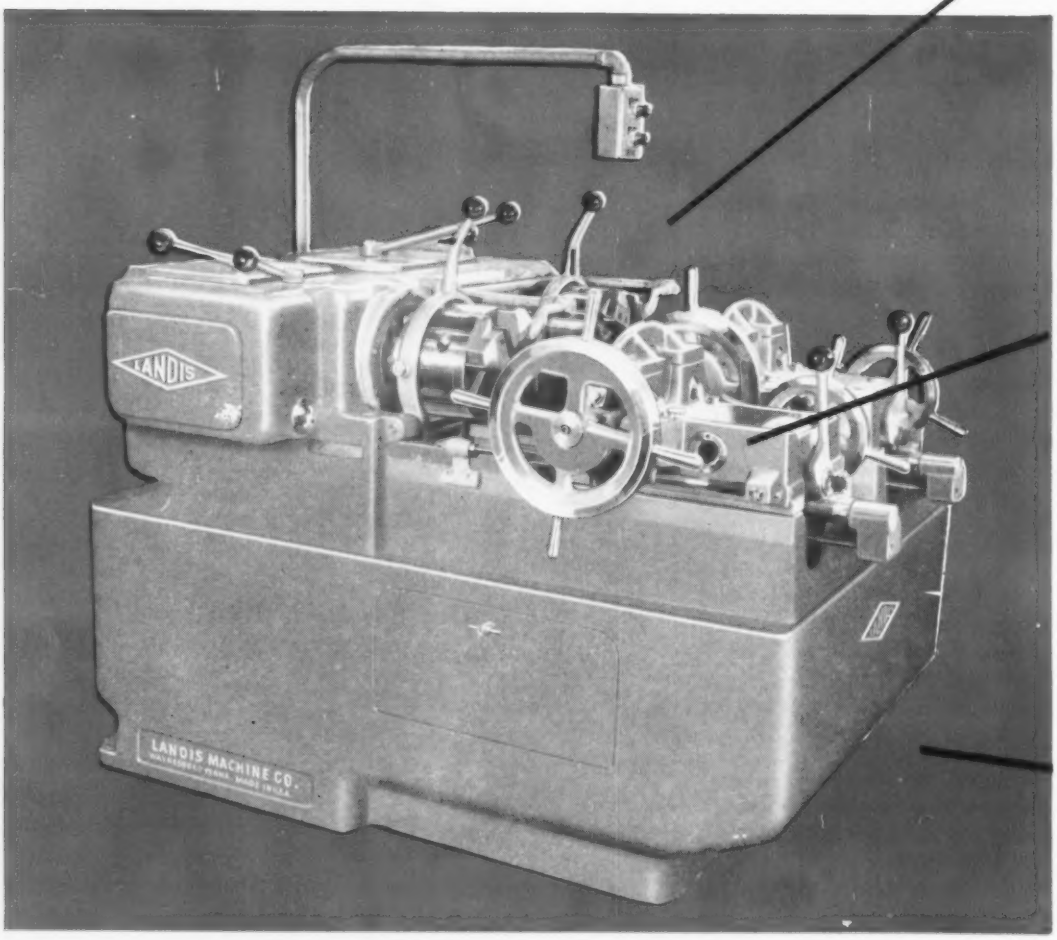
Custom-engineered for extra-dangerous hazards like spray booths, dip tanks and electrical equipment, the Kidde automatic carbon dioxide extinguishing system gives you the fastest, safest 'round-the-clock fire protection ever made! All operating parts completely enclosed for safety. No falling weights, no clumsy mechanical triggering methods. Self-contained, no outside power needed. Visual indicators to show if system is set or released. Easy testing of all operating parts. No parts to replace after operation or test. Clean, non-electrical conducting carbon dioxide gas snuffs fire out in seconds, vanishes into thin air. Leaves no mess, won't harm machinery. Write for Kidde's automatic carbon dioxide fire extinguishing systems booklet today.

Kidde **Walter Kidde & Company, Inc.**
649 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada Ltd., Montreal — Toronto

LANDMACO

threading machines

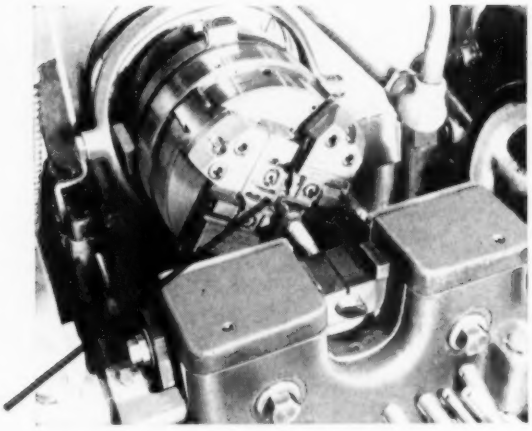


. . . . . are built in a wide variety of models for commercial, heavy duty, and precision threading from $\frac{3}{16}$" to 2½" in diameter.

Single or double-spindle models are available in varying bed lengths, with or without lead screw, using either of two die head styles, according to individual requirements. The die heads use LANDIS Tangential Chasers, which may be reground for 80% of their original length. Adaptation for oversize capacity and special jobs is easily made through auxiliary equipment.

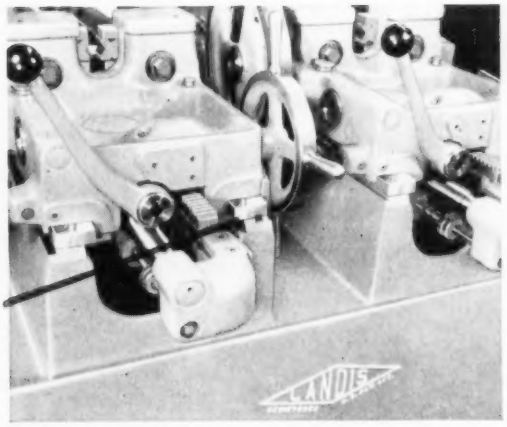
For more information, send specifications and ask for Bulletin H-76.

464C-2



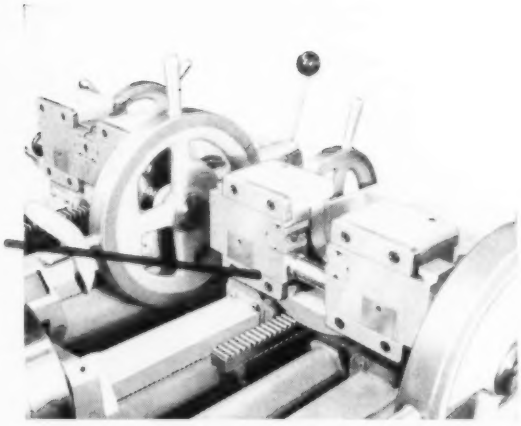
PRECISION

Hardened and Ground LANCO Die Heads combined with Lead Screw Feed enable threading to Class 4 and Class 7 tolerances. The fundamental design and specially selected and hardened materials of the die head provide the maximum rigidity required for this class work.



HEAVY-DUTY

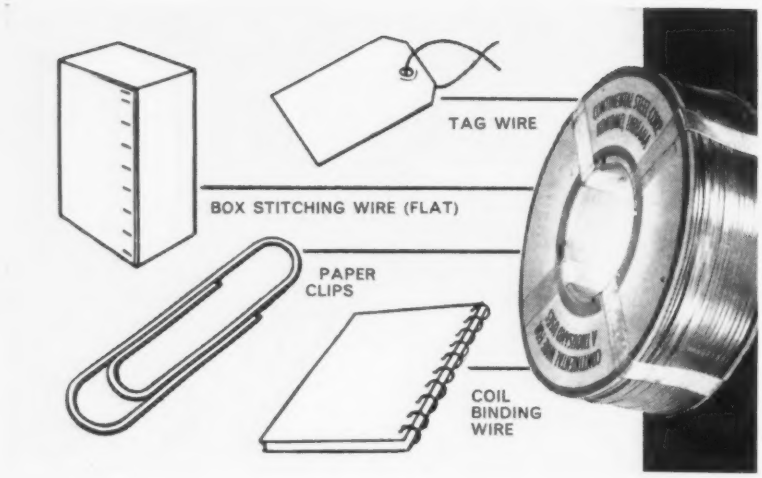
Lead Screw Feed and rugged LANCO Heat Treated Die Heads enable the unusually heavy cuts required for producing Acme threads. Despite the heavy rate of metal removal, workpiece slippage is prevented by vise gripping power intensified by a "hammer blow" operating handwheel.



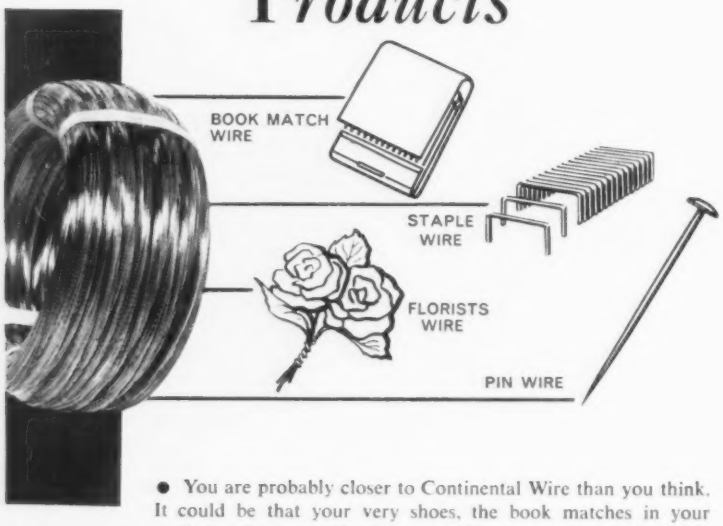
VERSATILITY

Each LANDMACO Threading Machine cuts a wide range of thread diameters—for example, the 12C LANDMACO has a standard threading range from $\frac{3}{8}$" to $1\frac{1}{2}$" in diameter, with oversize capacity to $3\frac{3}{4}$" for short thread lengths. Standard carriage vises enable the gripping of diameters larger than the machine's capacity, and special vises may be furnished. Tooling is available for Tapping, Turning, Grooving, Forming, and Facing operations.

LANDIS *Machine* COMPANY
WAYNESBORO • PENNSYLVANIA



Fine and Specialty Wire for Super Fine Products



● You are probably closer to Continental Wire than you think. It could be that your very shoes, the book matches in your pocket or the paper clips in your desk—were made using dependable Continental Fine Wire! That's because Continental is preferred by hundreds of leading firms for literally thousands of different fine wire applications. For super fine products—you, too, should try Continental Fine and Specialty Wire, available in many sizes, of almost any temper, finish or analysis, in low carbon and medium low carbon steels.

For the finest in fine wire—call in Continental!

CONTINENTAL

STEEL CORPORATION • KOKOMO, INDIANA

Wire Specialists for over half a Century

PRODUCERS OF: Manufacturers' Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence, and other products.

EXHIBITS, MEETINGS

Continued from P. 13

Hotel, New Orleans. Society headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Founders' Society of America—Fall meeting, Sept. 23-24, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland.

The American Society of Mechanical Engineers—Fall meeting, Sept. 23-25, Statler Hotel, Hartford, Conn. Society headquarters, 1010 Empire Bldg., Pittsburgh.

Standards Engineers Society—Sixth annual meeting on standardization — economy through application, Sept. 23-25, Hotel Commodore, New York. Society headquarters, P. O. Box 281, Camden, N. J.

Assn. of Iron & Steel Engineers—Annual convention, Sept. 23-26, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1010 Empire Bldg., Pittsburgh.

American Hot Dip Galvanizers Assn.—Semi-annual meeting, Sept. 26-27, Netherland-Hilton Hotel, Cincinnati. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

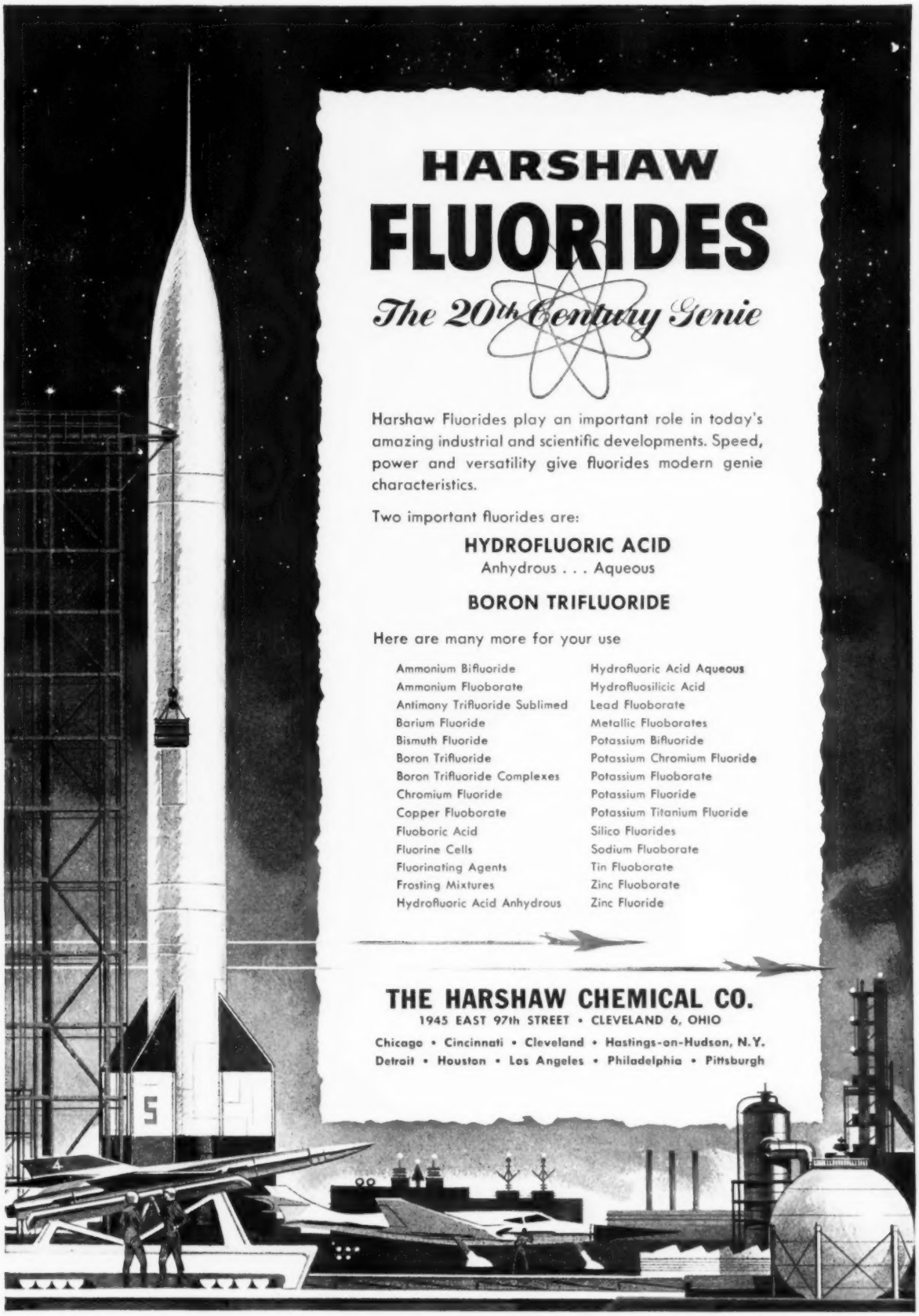
OCTOBER

The Electrochemical Society—Semi-annual meeting, Oct. 6-10, Statler Hotel, Buffalo. Society headquarters, 216 W. 102nd St., New York.

American Institute of Steel Construction — 35th annual meeting, Oct. 6-11, Hotel del Coronado, Calif. Society headquarters, 101 Park Ave., New York.

American Society of Lubrication Engineers—Fourth conference, Oct. 7-9, Royal York Hotel, Toronto, Ont., Canada. Society headquarters, 84 E. Randolph St., Chicago.

Committee on Vacuum Techniques—Fourth annual symposium on high vacuum technology, Oct. 9-11, Hotel Somerset, Boston. Society headquarters, Box 1282, Boston, Mass.



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FLUORIDES
The 20th Century Genie

Harshaw Fluorides play an important role in today's amazing industrial and scientific developments. Speed, power and versatility give fluorides modern genie characteristics.

Two important fluorides are:

HYDROFLUORIC ACID
Anhydrous . . . Aqueous

BORON TRIFLUORIDE

Here are many more for your use

- Ammonium Bifluoride
- Ammonium Fluoborate
- Antimony Trifluoride Sublimed
- Barium Fluoride
- Bismuth Fluoride
- Boron Trifluoride
- Boron Trifluoride Complexes
- Chromium Fluoride
- Copper Fluoborate
- Fluoboric Acid
- Fluorine Cells
- Fluorinating Agents
- Frosting Mixtures
- Hydrofluoric Acid Anhydrous
- Hydrofluoric Acid Aqueous
- Hydrofluosilicic Acid
- Lead Fluoborate
- Metallic Fluoborates
- Potassium Bifluoride
- Potassium Chromium Fluoride
- Potassium Fluoborate
- Potassium Fluoride
- Potassium Titanium Fluoride
- Silico Fluorides
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THE HARSHAW CHEMICAL CO.
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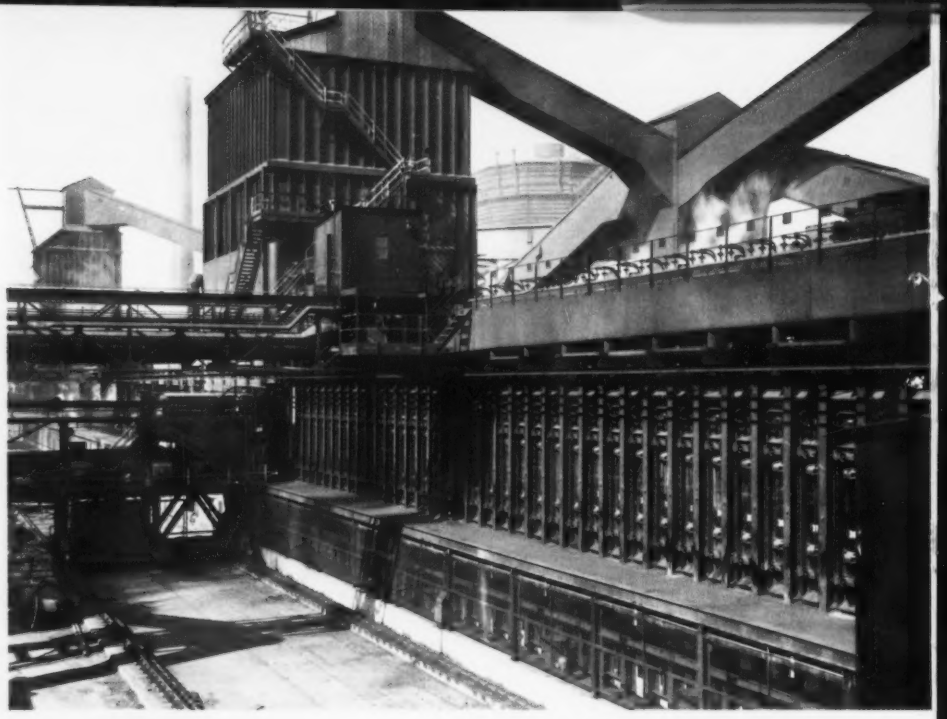


The New One. Battery No. 9, installed by Koppers last year, consists of 41 Koppers-Becker underjet ovens capable of producing 700 tons of furnace coke a day.

Below, ovens are pushed on a fixed 17-hour schedule.

294 KOPPERS COKE

THE NEW NO. 9 COKE BATTERY at Weirton Steel Company went into operation in November, 1956. These 41 Koppers-Becker underjet ovens and five previous batteries, all designed and built by Koppers, give Weirton a total coke-producing capacity of 1,900,000 tons per year.

There are good reasons why Weirton Steel Company, a division of National Steel Corporation, has always called on Koppers for coke plant design and construction. Koppers has been improving coke ovens since 1907—reducing operating costs, increasing the yield of chemicals, improving control of heating. These improvements can be measured in dollars—dollars saved where Koppers ovens are installed.

No Decarbonizing Equipment

Koppers-Becker underjet ovens eliminate the need for decarbonizing equipment because waste gas is recirculated to inhibit carbon formation in flues and in gas ducts. This also cuts fuel gas consumption.

KOPPERS

. . . and another new battery makes

OVENS AT WEIRTON STEEL!

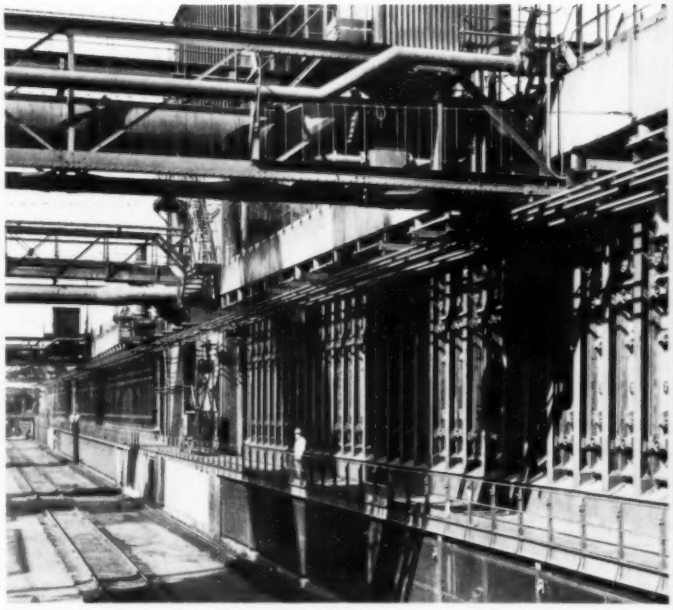
Koppers ovens provide unusually even coke temperature from top to bottom and from door to door. The result is extremely uniform coke.

Plant Layout and Design

Koppers research and engineering staffs can tailor designs and plant layouts to your needs . . . can help you with all problems connected with coal preparation and handling, coal-chemical recovery, light-oil refining and purification, phenol recovery, and other processes associated with coke plant operations.

• • •

Call Koppers for *any* type of steel-mill installation. Engineers from the Coke Plant Department, Freyn Department, and Chemical Department are prepared to work with you during all phases of plant construction, expansion, or rebuilding. Koppers Company, Inc., Coke Plant Department, Pittsburgh 19, Pennsylvania.

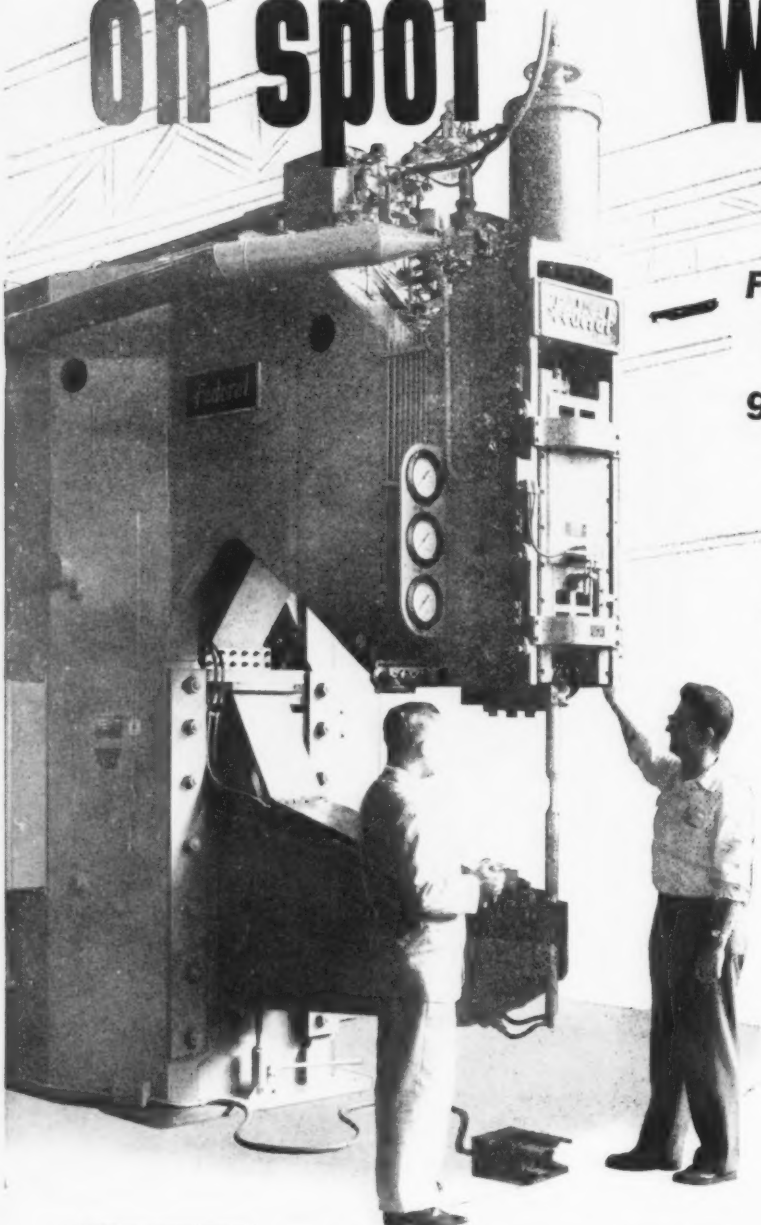


Weirton Ovens are 100% Koppers. Every coke oven built for Weirton Steel Company has been built by Koppers. In this photo are batteries 5, 6 and 8 . . . with 147 Koppers ovens in line.

KOPPERS

ENGINEERING AND CONSTRUCTION

...the BIGGEST story on spot welding!



Welding engineers testing record setting spot welder. Federal has been commissioned to build several more of these giants for aircraft manufacture.

Federal Built 14 ft., 28 ton giant goes into operation on west coast . . .

The biggest thing in aircraft spot welding—that's the huge new Federal Three Phase Frequency Converter Spot Welder designed to make spec plus welds on the tail section of a new commercial jet airliner.

More than 13 feet tall, the big welder weighs over 58,000 pounds, and has a special throat, or work clearance area, of some 2500 square inches.

The design and manufacture of the 12 ton unipolar transformer having an output in excess of 100,000 amperes and the requirements of meeting rigid deflection specifications on this large throat machine were just a few of the new problems encountered on this project. Federal experience and facilities once more provided the correct solutions.

Here again, is proof that large or small—standard or special—*Federal Stays First in Resistance Welding.*

Federal® WELDERS

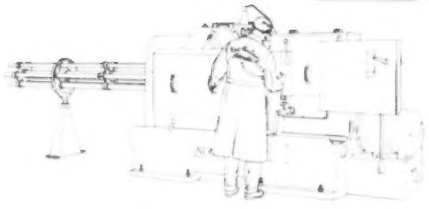
Warco® PRESSES

The Federal Machine and Welder Co.

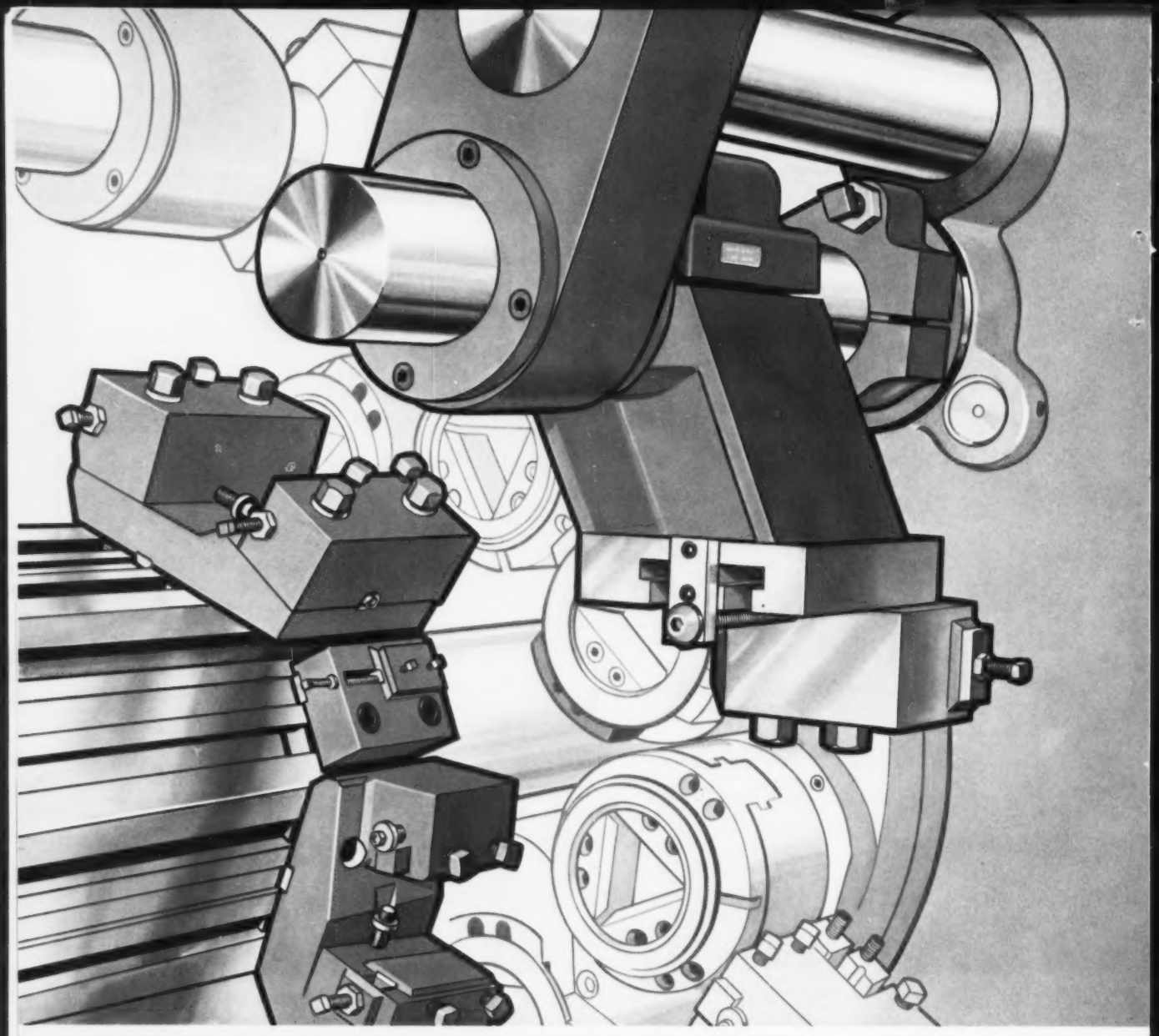
WARREN, OHIO

less wear means more profit

New Britain bar machines are "built to stay accurate." Hardened spindle nose cross slides, eccentric cross slide stop buttons and tool slides, plus carrier lifting during index, are only a few of many *exclusive* New Britain features for preserving long-run accuracy. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.



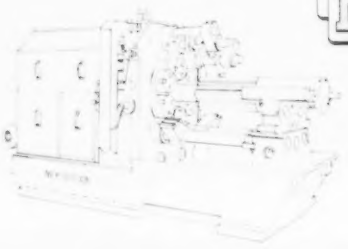
Automatic Bar Machine



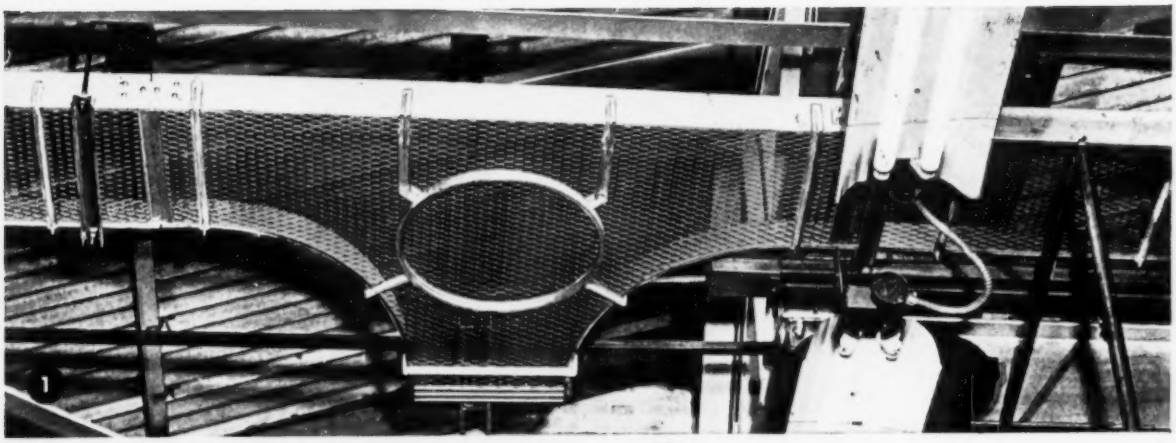
when the job calls for a big, husky chucker

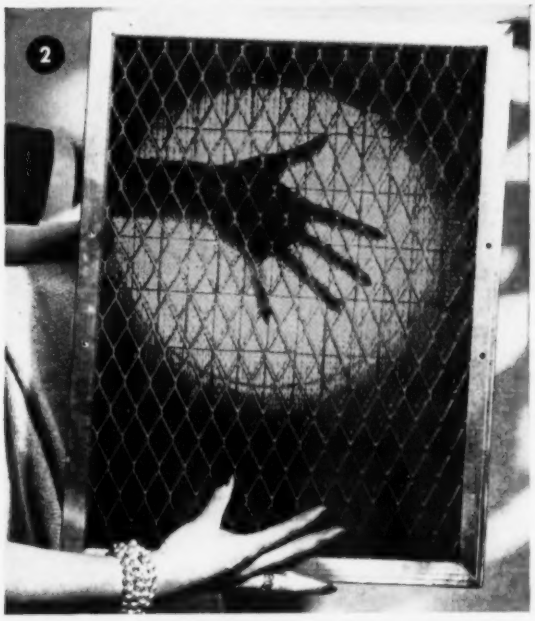
pick a New Britain

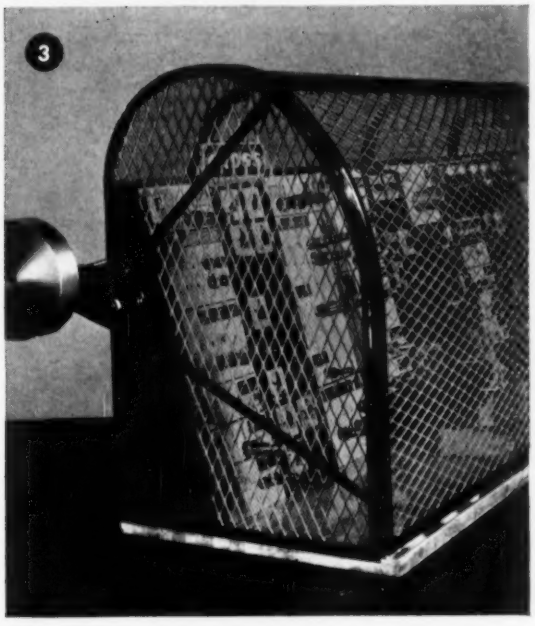
New Britains are massive, not only in over-all size and weight, but in every individual feature. Rugged forming arms and tool slides transmit smooth power to the cutting edge in every position. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.



Automatic Chucking Machine







3 PROBLEMS OF PRODUCT DESIGN...

solved with expanded aluminum

1. High strength, low weight and economy for cable basket—a product of Husky Products, Inc., Cincinnati, O.

2. Corrosion-resistant grille for permanent heating or air-conditioning unit filter—made by Hadley Products Co., Inc., Marietta, O.

3. Strong, open-mesh guard for control and tool panel —Cross Company, Detroit, Mich.

Many products like these have proved successful because their designers took advantage of the valuable properties of Penmetal expanded aluminum.

Up to 80% lighter per square foot than the original sheet, yet fully as strong, Penmetal expanded aluminum can help you design lighter-weight products that will last longer. Its corrosion resistance means durability; sustained clean appearance. Its open mesh permits free passage of light, air and water. What's more, this handsome mesh is easy to weld and surprisingly low in cost.

Products designed in Penmetal expanded aluminum are improved products – products that find better sales acceptance. Want to know more? Send for folder 507-EM. No cost or obligation.

PENN METAL COMPANY, INC.

General Sales Office: 40 Central Street, Boston 9, Mass.

Plant: Parkersburg, W. Va.

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Penmetal

PM-142

Take a new

Call the Carpenter Mill-Branch Warehouse or Office nearest you, *now* . . .

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Chicago, Illinois
HAymarket 1-8085

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REdwood 1-5088

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PRospect 1-4384

Dayton, Ohio
MIchigan 7456

Detroit, Michigan
TYler 5-0500

Hartford, Connecticut
JAckson 7-7174

Houston, Texas
OLive 4-6564

Indianapolis, Indiana
MElrose 2-5401

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LUdlow 7-9131

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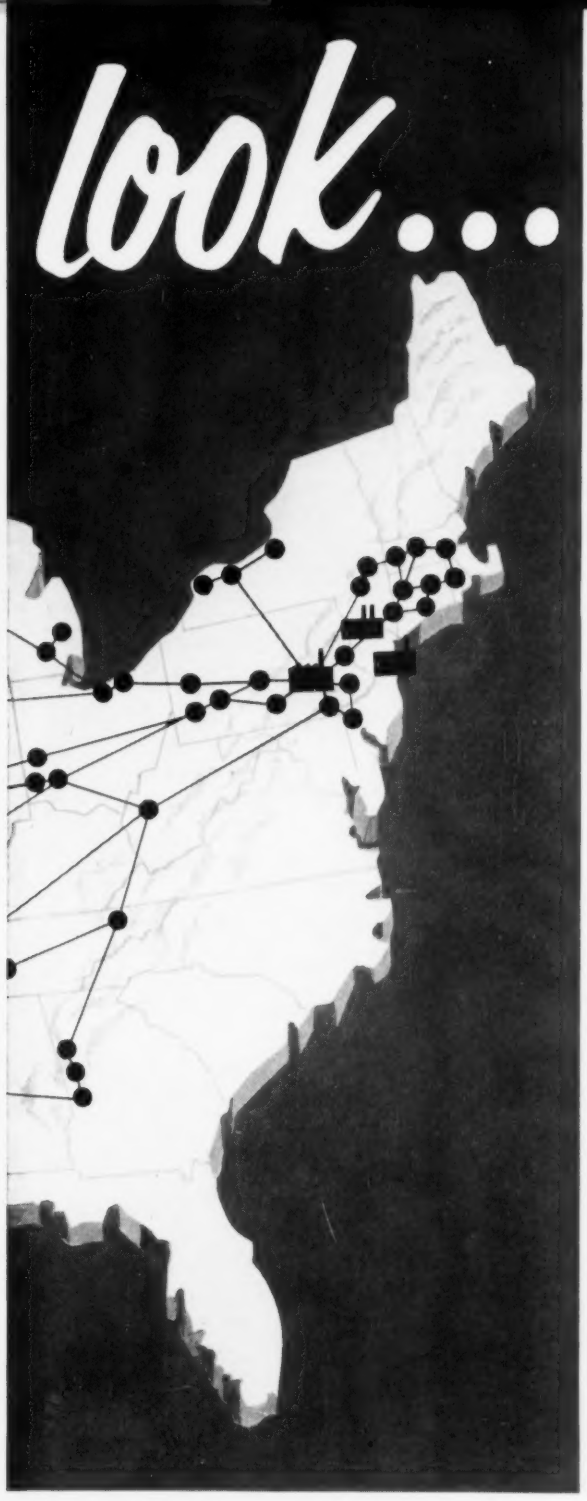
Plus representation in other principal cities throughout the U. S.



at where to get faster delivery and service on specialty steels

Wherever you are, there's a Carpenter Mill-Branch Service-Center in your area. Have you been in touch with us recently?

If not, we believe it will be worth your while to place a call today. Especially if you're looking for the kind of service and cooperation that can lead to new savings in your own use of specialty steels.

For example, look at your inventory from the standpoint of the manpower and paper work required to handle it . . . the valuable space it may be wasting . . . the dollars that may be tied up unnecessarily.

Carpenter's ability to meet your day-to-day specialty steel needs quickly, and without hesitation can do much to help you reduce a host of inventory problems. We're continually building our stocks of tool, stainless and alloy steels for fast delivery . . . to enable you to trim your own stocks to more profitable levels.

Important, too, is the cooperation you'll get from the folks at Carpenter. Whether it involves the order desk people — your Carpenter Representative, the warehouse crew or the office staff — they're all part of a team working for you. Their constant aim is to help you *hold down* specialty steel costs and improve your results.

For service that's backed by more dependable action . . . and delivery that's backed by a wider selection of specialty steel grades and sizes—call Carpenter, now. The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

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Rochester, New York
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OLive 2-6700

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Mill-Branch Warehouse Service

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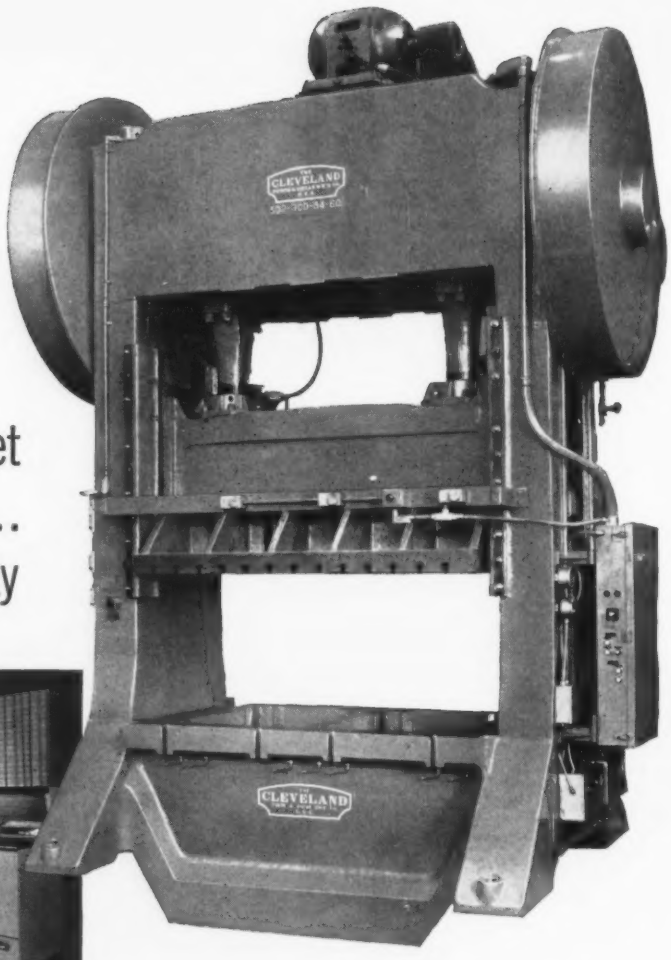
With stampings you get construction economy... design flexibility

Courtesy of Youngstown Kitchens of American-Standard, Warren, Ohio



New **Cleveland Presses** give you low cost stampings.

The many advantages of stampings are readily apparent as you look at today's modern kitchens. For stampings have opened the door to more graceful product designs . . . improved finishes. Weight has often been reduced with no sacrifice of strength. All at lower unit cost.

New Cleveland Presses improve stamping quality . . . keep production costs down. Simplified, rugged construction of every Cleveland Press gives you reserve capacity for added safety and dependable performance. Sturdy frames strengthen and minimize deflection under rated capacity, assure stamping accuracy . . . assure long die life. Patented Cleveland Clutch assures operating economy . . . low-cost maintenance.

Each of the 11 types of Cleveland Presses is available in a wide range of sizes designed to meet your exacting requirements . . . to assure low stamping costs, faster production. For big jobs or small ones, call or write today for complete information to The CLEVELAND Punch & Shear Works Co., East 40th and St. Clair Ave., Cleveland 14, Ohio.

Offices at: New York • Chicago • Detroit • Philadelphia • East Lansing • Cincinnat

Power Presses
Fabricating Tools
Punching Tools & Dies

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Established 1890

STAINLESS STEEL MAKES THE DIFFERENCE

...its effect on modern plane construction

Stainless steel honeycomb is bonded between thin sheets of stainless steel to combine strength with lightness.

With this new construction, designers form rear nacelles, struts, underwing area panels, ailerons and rear fuselage panels near the "hot" zone of the inboard engine as well as other key points.

For more information about stainless steel and the contribution it can make to your design or marketing problems, see your stainless steel supplier or write ELECTROMET—leading producer of over 100 alloys for the metal industries, including chromium and manganese for making stainless steels. ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

METALS DO MORE ALL THE TIME ...THANKS TO ALLOYS

The new B-58 Hustler gets its strength with light-weight stainless steel in new honeycomb construction! This design combines rigidity with resistance to heat and corrosion.

Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

HOW MUCH A POUND DID YOU PAY FOR THE HOLE?

NOT ONLY FOR THE METAL ALONE BUT ALSO IN UNNECESSARY MACHINING TO MAKE THE PART YOU NEED

You don't buy "waste-metal" and lost time when you specify *ESCO* Spuncast — the centrifugally cast alloy steel with the built-in hole.

ESCO Spuncast is a homogeneous, pressure formed metal tube possessing chemical balances free from flow lines, forging or rolling stresses. A non-directional metal structure, available in many superior alloys, in sizes, grades and quantities not practical for large scale rolling mill production.

ESCO Spuncast is the new basic material for the mass machining of duplicate cylindrical parts. Available in sizes up to 36" O.D., lengths to 16 feet and in wall thicknesses from ¼" in suitable corrosion, heat and abrasion-resistant alloys.

See your ESCO Dealer. Ask for ESCO Catalog No. 184.

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ELECTRIC STEEL FOUNDRY COMPANY

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MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

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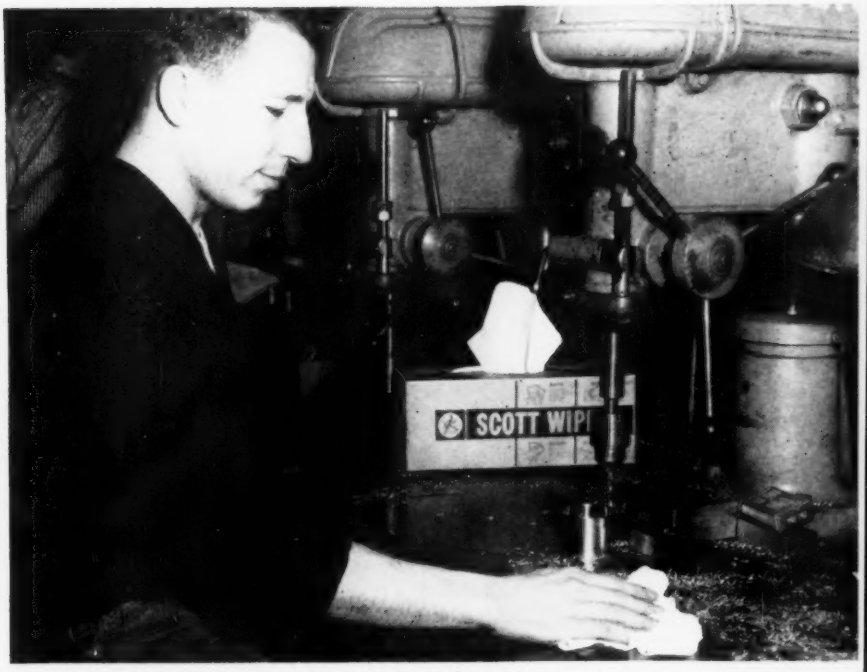


Scott Wipers* are soft, absorbent, and Perf-embossed.® This exclusive process creates angled surfaces which soak up liquids faster, give thorough cleaning action. Chemically treated for wet strength, Scott Wipers are ideal for wiping machines, tools, stock, hands, face. *PATENT PENDING

WIPER PROBLEM? Look what Crane Packing Company did with Scott Wipers!

Crane Packing Company, Morton Grove, Illinois, makes lapping machines, packings, mechanical seals. Industrial wiping was done by rags—until Crane decided this method was too costly.

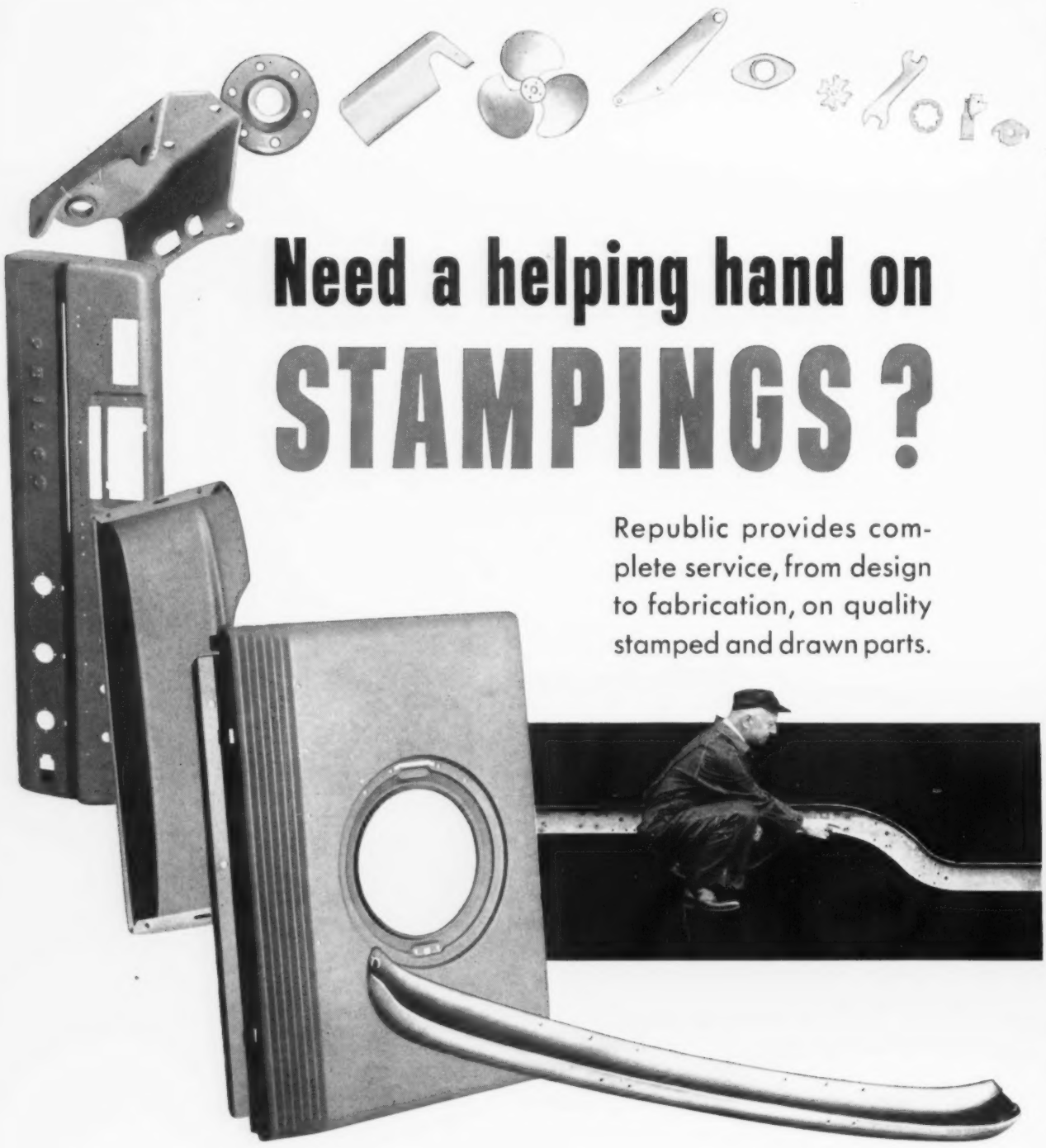
Seeking a less expensive way of wiping, management switched to Scott Wipers . . . sanitary, strong, uniform and lint-free. This cut material costs by nearly 39%.

Crane found that Scott Wipers lowered the accident rate—fresh from the box, these clean, fresh, highly absorbent sheets carry no hidden particles to scratch and cut. And no buttons to mar delicate work surfaces. Scott Wipers are used in many areas throughout the plant . . . always at hand near each user, easily disposable in handy receptacles.

Like to improve product quality, boost your housekeeping efficiency, do better wiping on tools, machines, stock, hands, faces? Call your local Scott distributor, or write Scott Paper Company, Department IA-76, Chester, Pennsylvania.

SCOTT PAPER COMPANY

Makers of the famous Scott paper products you use in your home. Consult TV schedules for Scott's program, "Father Knows Best."



Need a helping hand on STAMPINGS?

Republic provides complete service, from design to fabrication, on quality stamped and drawn parts.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

● Republic's Pressed Steel Division has years of know-how and experience gained from making large and small, light- and heavy-gage stampings for all types of industry.

● Republic is fully staffed with production engineers, tool and die designers, and die-makers to deliver the best product for your best production.

● Republic's production facilities are second to none. Presses and assembly equipment are available for blanking, cold forming, hot forming, and drawing operations on carbon and alloy steels or non-ferrous metals. Our equipment is capable of handling the heaviest gages used in industry.

● Republic is geared up not only to stamp and draw quality parts, but also to make complete assemblies including welding, brazing, annealing, machining, riveting, galvanizing, and painting.

● Republic can help you reduce your inventories, your overhead and materials handling costs.

Contact your local Republic office now for complete information.

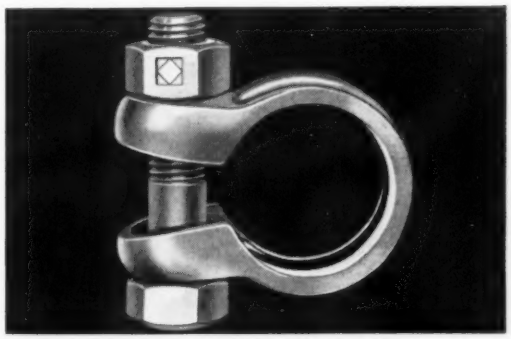
Write for this helpful booklet

...it contains detailed information and photos on Republic's Pressed Steel Division production facilities—plus various parts that Republic has made in both large and small quantities. It may give you an idea on parts that we can produce for you.

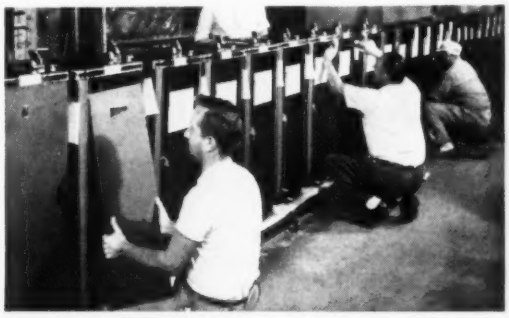
STEEL

and Steel Products

OTHER REPUBLIC SERVICES AND PRODUCTS FOR HIGH-VOLUME PRODUCTION



REPUBLIC NYLOK® NUTS proved to be the solution for fast production and plus-safety features in the manufacture of an automobile steering mechanism, shown above. Nylok nuts are ideal for automatic feeding, and give a permanent, vibration-proof lock. Easy adjustment and re-use are assured by permanent resiliency of the nylon pellet.



REPUBLIC ELECTRO PAINTLOK made it possible to double painting production with existing facilities. By using electro paintlok, Temprite Products Corporation, manufacturer of water coolers, eliminated a primer coat—one painting and drying operation—yet still maintained a high-quality, long-lasting finish.

REPUBLIC METALLURGISTS, working closely with Yankee Tool, Inc., engineers, came up with the exact type of Republic Cold Finished Steel for this spiral driver. Precise size and cross section, excellent physical properties, and a high degree of machinability meet the requirements of Yankee engineers. The continuing success of the "Yankee" Spiral Driver is evidence of Republic quality steels.

REPUBLIC STEEL CORPORATION
DEPT. C-4171
3104 EAST 45th STREET • CLEVELAND 27, OHIO

☐ Please send me your Stamping Booklet ADV-681
I would like more information on:
☐ Cold Finished Bars ☐ Nylok Nuts
☐ Electro Paintlok® Sheets

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Company _____

Address _____

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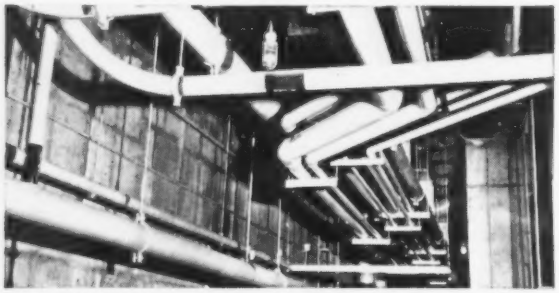
BLAW-KNOX has what it takes—to provide these products and services

A Blaw-Knox automatic sprinkler system could have prevented this disastrous fire. Each year a serious fire strikes one out of seven manufacturing firms in this country. And out of every 100 firms who lose their records in a fire, 43 never reopen for business. So why take any chances.

Blaw-Knox engineers, fabricates and installs automatic sprinkler systems that are always alert to detect, confine and quench a fire at its origin. Qualified engineers custom-design systems that meet individual requirements—and fulfill all insurance standards and municipal codes. A Blaw-Knox automatic sprinkler system pays for itself in a few years through savings in reduced insurance premiums.

Let a Blaw-Knox fire-protection engineer study your needs, submit a layout and estimate, and tell you how you can pay for the system on our lease or deferred payment plan. For more complete information, write for Bulletin No. 2426—"Fire Can Destroy Your Business."

Blaw-Knox trapeze functional spring hangers, with the patented internal swivel action, support power piping in new generating station. Our experienced engineers are available to both design and make recommendations for your hanger requirements. For further information, send for Catalog No. 54.



High temperature, high pressure oil tunnel piping in large steel mill is typical of many piping systems prefabricated and erected by Blaw-Knox. Experienced piping engineers, modern shop facilities and a new Blaw-Knox digital computer method for fast, accurate calculation of piping stresses are available to you. Let us know your requirements and we will provide the service you need. For additional information, write for Bulletin No. 2443—"Piping for Industry."

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Power Piping and Sprinkler Division

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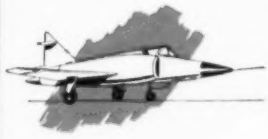
Complete facilities for prefabrication and erection of piping systems for all pressures and temperatures . . . complete line of standard and custom-engineered pipe hangers, supports and vibration eliminators . . . complete line of automatic sprinkler systems for standard and special hazards

What's YOUR Roller Bearing Problem?

HYATT BUILDS AMERICA'S MOST COMPLETE LINE OF CYLINDRICAL ROLLER BEARINGS TO SOLVE IT BETTER!

HYATTS ARE DESIGNED:

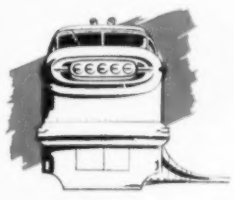


FOR SPEEDS UP TO 50,000 RPM

From bearings for slow-moving construction equipment to supersonic jet engines, Hyatt builds roller bearings to meet almost any speed requirements.

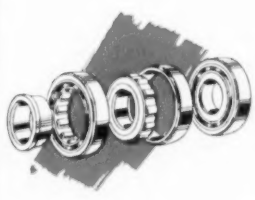
FOR TEMPERATURES FROM BELOW ZERO TO 450° F.

Conventional steels can be stabilized by heat treatment for operation up to 450° F. Beyond this we can provide special high-temperature steels for special needs.



FOR LOADS RANGING UP TO 103,000 POUNDS

From small bearings for lawn mowers to the huge heavy-duty types used in giant diesel locomotives, Hyatt builds bearings for every load requirement!



IN SIZES RANGING FROM ¾" OD TO 14" OD

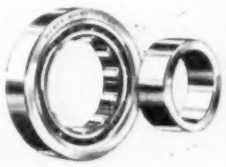
Hyatt offers a wide variety of bearing types and sizes. Each Hyatt Roller Bearing assures maximum life in each individual application.

Life, load, speed, temperature, shaft location—almost every roller bearing application problem you are likely to face has *already* been encountered by Hyatt engineers.

Armed with a complete line of bearings, they can usually come up with an answer to your particular design problem. In addition to competent design assistance, you can also depend upon the consistent high quality and uniformity of Hyatt Bearings.

HY-LOAD

High-capacity cylindrical roller bearings for heavy radial loads and light or intermittent thrust loads.

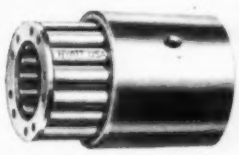


INDUSTRIAL INCH

Designed for slow-moving, heavily-loaded machinery where large-diameter shafts are usually employed.

TRUNNIONED ROLLER

For industrial trucks, textile machinery, gear pumps, conveyors, hoists and agricultural equipment.



WOUND ROLLER

A three-part separable bearing, which provides maximum resistance to shock, abrasion and fatigue.

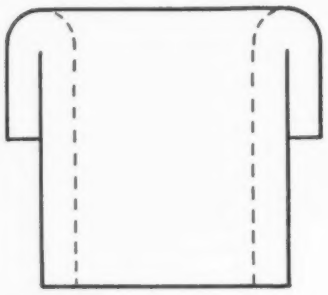
These are a few of the reasons why experienced design engineers have learned to reach for a Hyatt catalog. If you need the technical assistance of a sales engineer, call or write Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey, Pittsburgh, Chicago, Detroit, Oakland, Calif.

AVAILABLE THROUGH UNITED MOTORS SERVICE DISTRIBUTORS EVERYWHERE

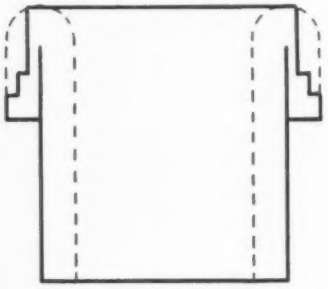
GM PARTS SALES

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY

more proof of *Carpenter* quality . . . at no extra cost



Reverse bend is made on one end, doubling the pipe back on itself.



Machining is then performed on the doubled back part of the pipe as shown in photo.

Carpenter Stainless Pipe shows fabrication savings!

Only the highest quality stainless pipe and tubing with outstanding uniformity in properties and dimensions can take this punishing reverse bend (see sketches) and succeeding machining operations. The part is made from 2" Carpenter Schedule 40 pipe, and must meet close tolerance requirements consistently.

If more of this kind of proof is needed, call your nearest Carpenter Distributor today. He has the service and stock to serve you right!

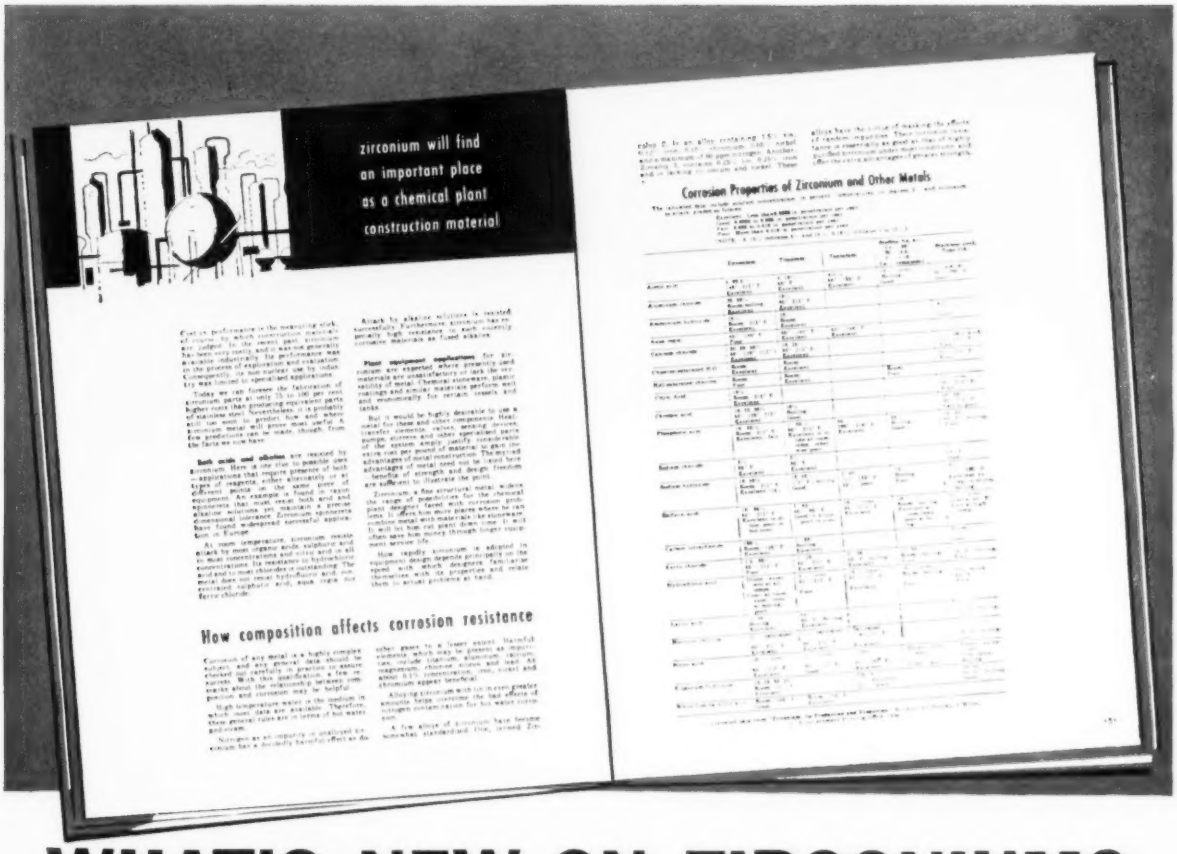
MEMBER

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe


zirconium will find
an important place
as a chemical plant
construction material
How composition affects corrosion resistance
Corrosion Properties of Zirconium and Other Metals

WHAT'S NEW ON ZIRCONIUM?

This U.S.I. booklet gives you information you can use . . . Send for a copy!

Today, with zirconium production trending sharply upward, and price downward, interest in this new and unique metal is growing rapidly.

To answer your questions about zirconium and its relative, hafnium, U.S.I. has prepared an informative new booklet — "ZIRCONIUM and HAFNIUM." The booklet gives the important facts on these newly available metals . . . lists important mechanical and physical properties of both . . . describes briefly the new semi-continuous sodium reduction process for production of zirconium and hafnium.

You'll find the outstanding corrosion properties of zirconium compared with other important metals... phase diagrams of twenty binary alloy systems . . . descriptions of several fabrication techniques.

You're sure to find "ZIRCONIUM and HAFNIUM" valuable in discussions and as a preliminary reference. For your copy, forward the coupon today . . . or just send your name on your company's letterhead.

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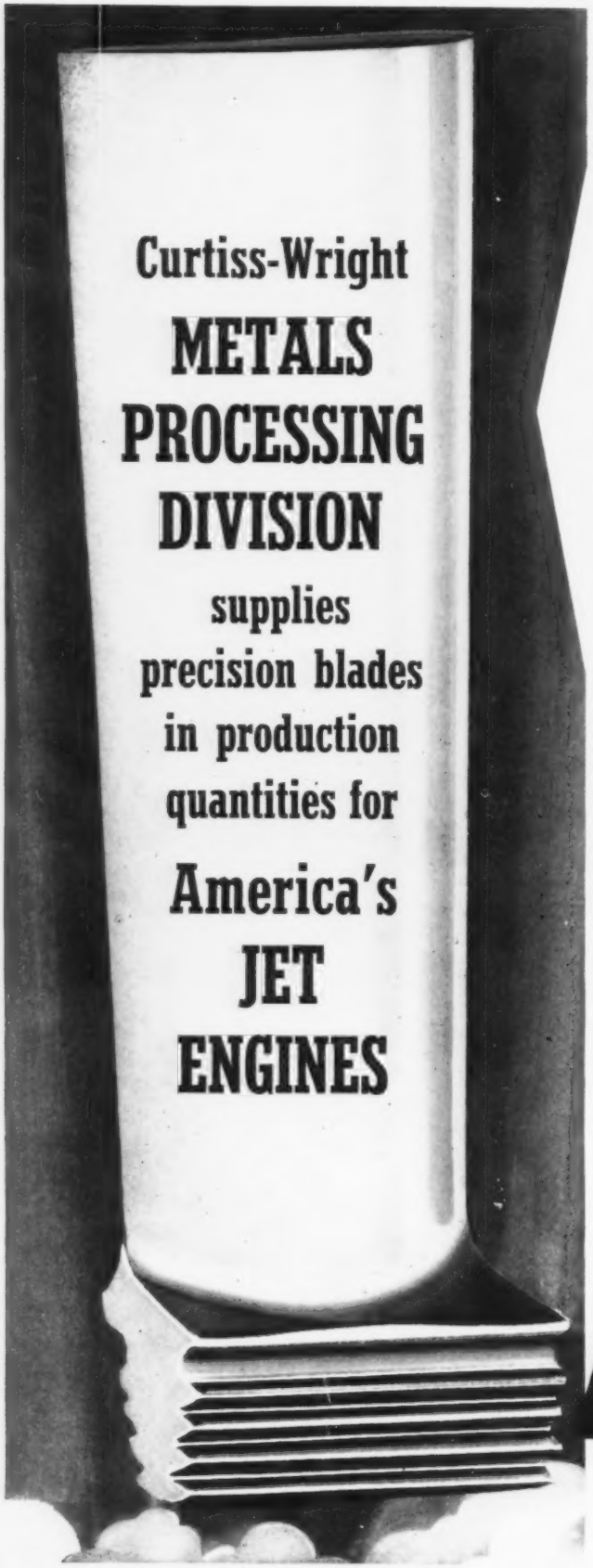
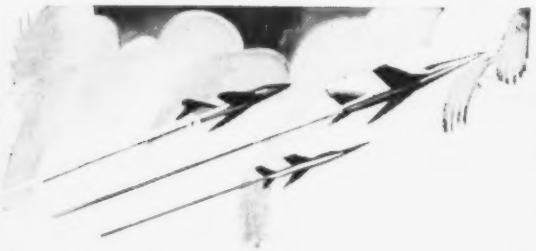




FORGING

Air Superiority for National Defense

A complete prototype service for the design and production of jet engine blades is ready to work for you at the Metals Processing Division of Curtiss-Wright. One of the most experienced blade producers in the industry – now turning out thousands of blades daily – the Metals Processing Division can contribute importantly at any stage of your operation . . . from blueprint through prototype . . . from processing of pilot quantities to full volume production.

The Division's precision controlled production means more accurate development now . . . smoother production later. Coordinated facilities for casting, forging, grade rolling, machining and extrusion round out the picture. Write today for qualified engineering consultation, without obligation.

72 Grider Street, Buffalo, New York

METALS PROCESSING DIVISION
CURTISS-WRIGHT
CORPORATION • BUFFALO, N. Y.

always SOMETHING NEW in making butt weld pipe...

• Seldom will you see two butt weld pipe mills exactly alike. Each mill has individual ideas for the specific producer.

Many ideas originate with the pipe producer, who joins with Aetna in developing the equipment. Many ideas originate with Aetna and should... we design and build more butt weld pipe mills than any other manufacturer.

Here are two familiar examples — the Rotary Hot Saw and the Rotary Kick-out. Right now, Aetna's engineers have several ideas on the drawing boards for butt weld pipe. You will hear about them soon.

Whether your present pipe mill needs modernizing or replaced, Aetna-Standard is the manufacturer with the experience and the new ideas.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. PLANTS: ELLWOOD CITY, PA., WARREN, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

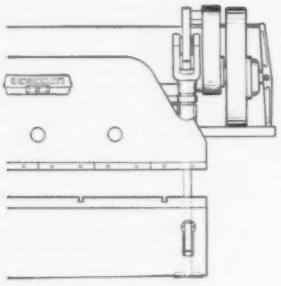
DETREX CHEMICAL INDUSTRIES *say:*

"Our sheet metal department is built around Cincinnati Shears and Press Brakes."

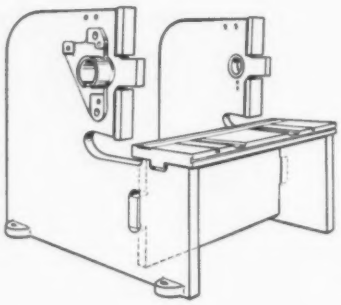
Three Cincinnati Shears and two Cincinnati Press Brakes are operating profitably in this finely equipped shop. All of the sheet steel parts needed to fabricate an entire line of drycleaning equipment are produced on these versatile machines. The materials range in thickness from No. 16 gauge to $\frac{3}{8}$".

An interesting feature of this application is the adjustable handling "table" made by inserting ball-transfers into prepared holes in the plant floor. Plugs cover the holes when they are not being used. This system solves the problem of getting a variety of pieces from the Shears to the Press Brakes.

Centerline Loading is a standard feature of all Cincinnati Press Brakes. Since working forces are contained directly in the housings, weaving of the frame and cramping of the ram slides, guides and shaft bearings are eliminated. Centerline loading makes it possible to concentrate most of the weight of a Cincinnati Press Brake in the four main members, which provides maximum strength per pound of machine. Write Department B for Catalog B-4R, which gives full details.



All-Steel, Interlocked Construction is a standard feature of Cincinnati Shears. All the main members are of rolled steel plate, yet no welds are used as load supports. In addition to eliminating strains which affect accuracy, Cincinnati interlocked construction also reduces freight, foundation and installation costs. Write Department B for Catalog S-7R, which gives full details.

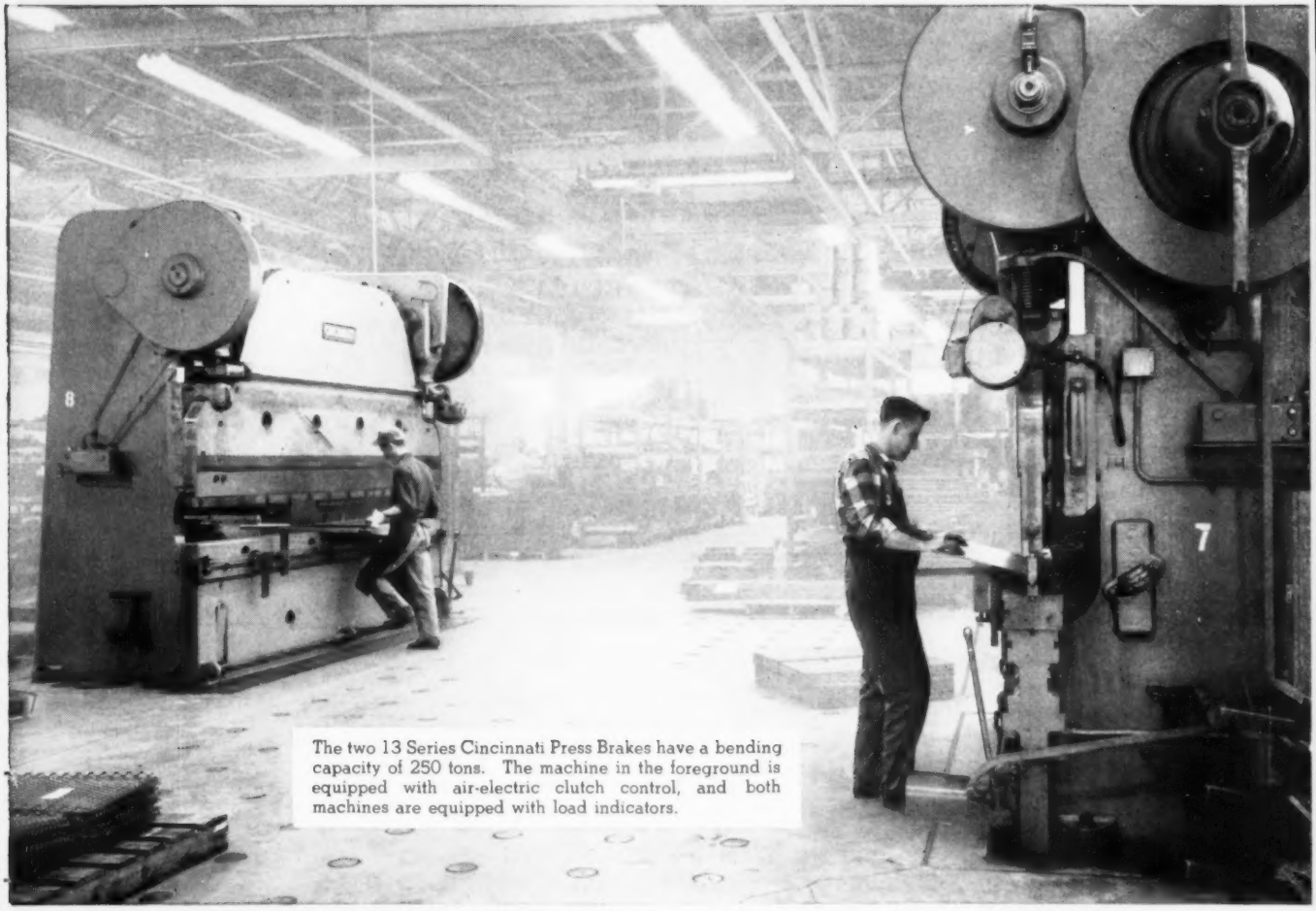


CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES

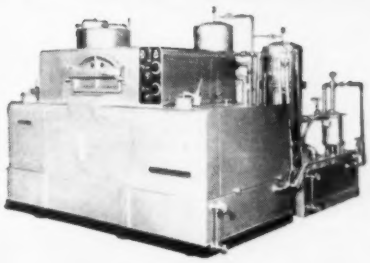
The 2510 Series Shear at the left has a capacity of $\frac{3}{8}$" x 10' mild steel. The 1410 and 1406 Series Shears at the right have capacities of $\frac{3}{16}$" x 10' and $\frac{1}{4}$" x 6' mild steel respectively.



The two 13 Series Cincinnati Press Brakes have a bending capacity of 250 tons. The machine in the foreground is equipped with air-electric clutch control, and both machines are equipped with load indicators.

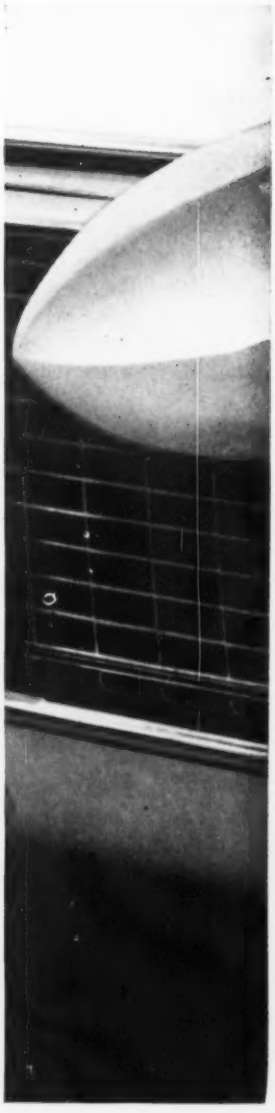
Photographs courtesy Detrex Chemical Industries, Inc., Bowling Green, Kentucky.

This two-bath Ambassador Model 600S drycleaning machine is typical of the Detrex line of quality equipment produced with the aid of Cincinnati Shaper Company machines.



For whatever you fabricate . . .

N-A-X FINEGRAIN STEEL COMBINES STRENGTH WITH FORMABILITY



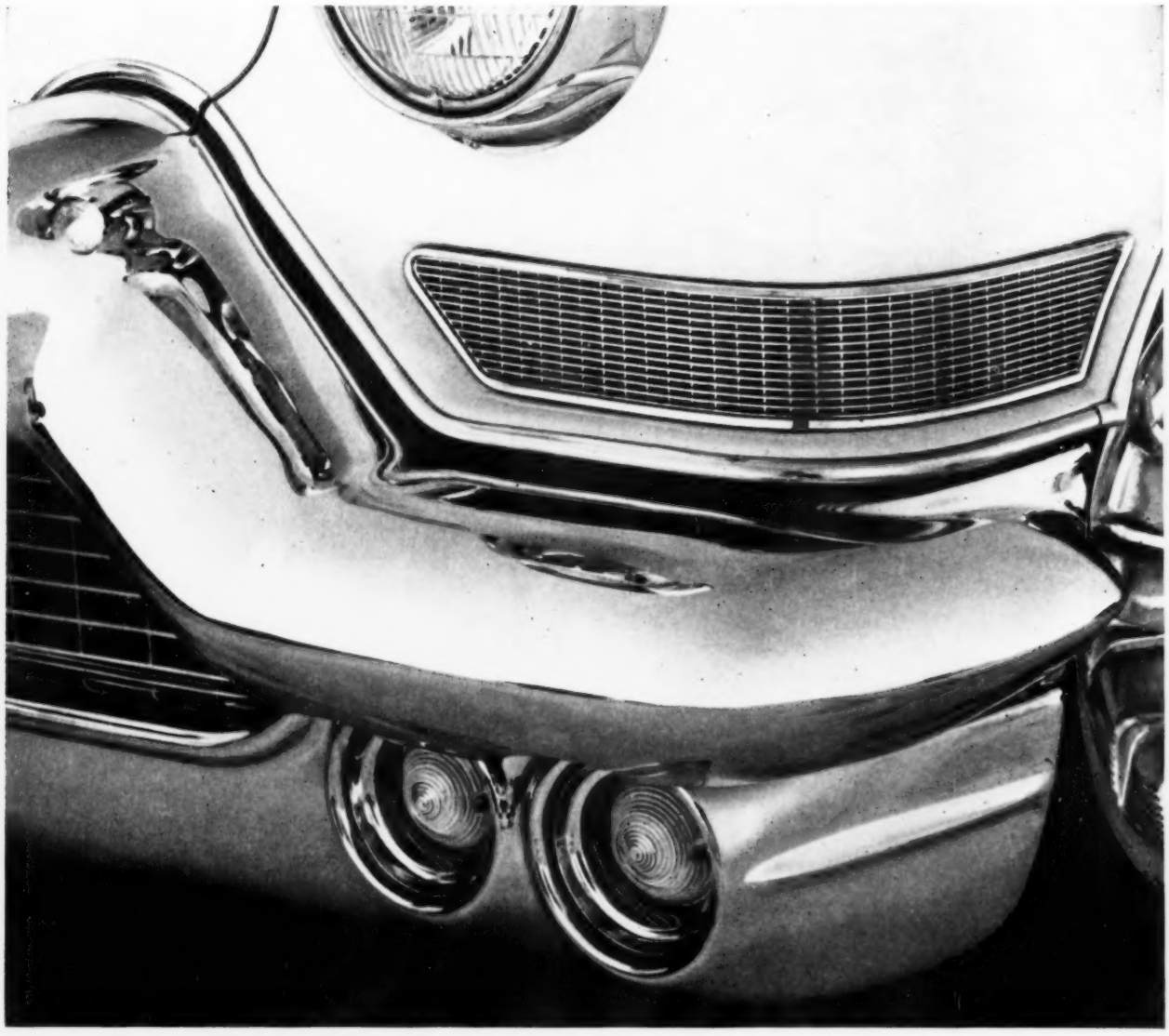
Among the many economical advantages of N-A-X FINEGRAIN—a low-alloy, high-strength steel with widely diversified applications in modern metals design—is its combination of great strength with excellent formability. Even at the higher strength levels (50% greater than mild carbon steel) N-A-X FINEGRAIN can be cold formed and drawn into difficult stampings and cold formed shapes.

Take these qualities and add the ability of N-A-X FINEGRAIN to be readily polished to a high luster at minimum cost, and when plated, you have a steel ideally suited for such applications as bumpers, bumper guards, and many others where strength and toughness with good finish is important.

Engineers and designers like N-A-X FINEGRAIN especially because its physical properties are inherent in the "as rolled" condition. No subsequent treatment is needed to insure its characteristics.

Check these other important advantages: N-A-X FINEGRAIN steel, compared with carbon steel, is 50% stronger • has high fatigue life with great toughness • is stable against aging • has greater resistance to wear and abrasion • is readily welded by any process • offers greater paint adhesion. NOTE: Where greater resistance to atmospheric corrosion is an important factor, our N-A-X HIGH-TENSILE steel is recommended.

For whatever you fabricate, from bumpers to bulldozers, with N-A-X HIGH-STRENGTH steels you can design longer life, or less weight, and economy into your products. Let us show you how.



One of many applications where N-A-X FINEGRAIN'S strength with formability saves production money.

N·A·X
HIGH-STRENGTH STEELS

N-A-X Alloy Division, Dept. A-4
GREAT LAKES STEEL CORPORATION
Detroit 29, Michigan • Division of
NATIONAL STEEL CORPORATION

N-A-X Alloy Div., Dept. A-4
Great Lakes Steel Corp., Detroit 29, Mich.

☐ Please send me technical data on N-A-X FINEGRAIN steel.
☐ Please have your representative contact me.

Name_____ Title_____

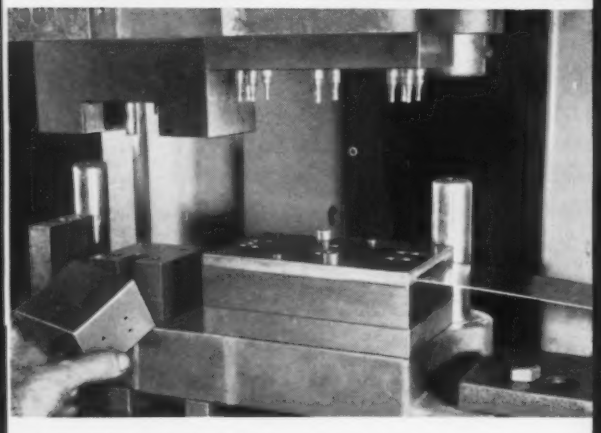
Company_____

Street_____

City_____ Zone____ State_____

Take it from the early birds...

"IT'S THE GREATEST



Niagara Series E 4½ OBI Press in operation at a well known eastern commercial stamping plant. Work includes stamping small wrenches; trimming canopies for electrical fixtures; piercing, cutting off and forming saddles with a progressive die (shown).

Niagara Series E 4½ OBI Press engaged in blanking and drawing of kitchen cannister lids from half-hard aluminum at midwestern housewares manufacturing plant.

"we can produce from 8,000 to 10,000 pieces in an eight hour day"

"much safer press"

"takes less floor space"

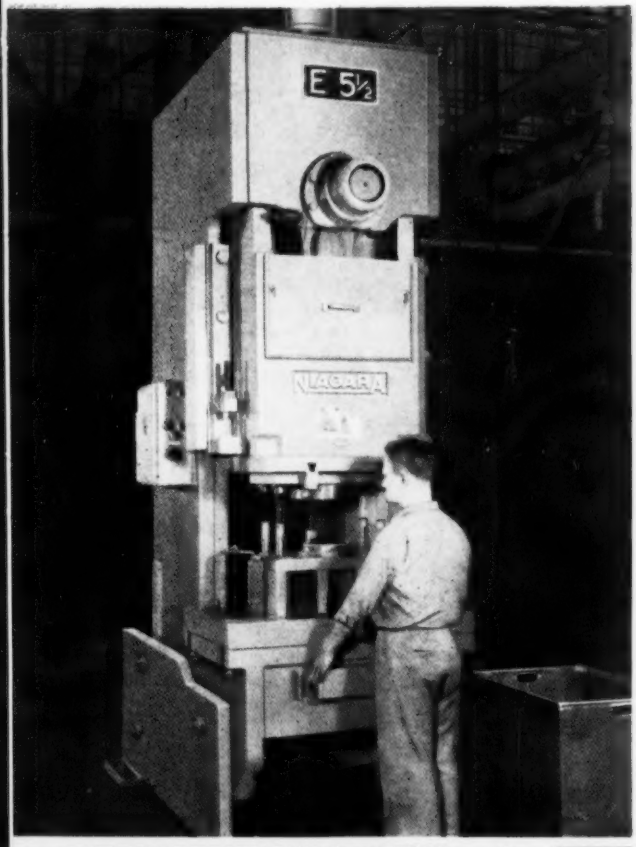
"has a centralized pressure lubricator which we like very much"

O.B.I. EVER BUILT"

"we find that dies without posts work much better on this press"

"all dies give better and longer runs"

"large slide area for large trimming, blanking and progressive dies"



Niagara Series E 5½ OBI Press forming and trimming hemispherical copper parts for one of the "Big Two" electrical manufacturers.

Few developments in metalworking history have drawn the enthusiastic endorsement given Niagara's revolutionary Front-to-Back Crankshaft OBI Press.

Now, as at the 1955 Machine Tool Show where it was unveiled, there is *nothing* even remotely resembling it in the industry ... design-wise and production-wise.

Customers in U.S. and Canada ... the "early birds" who are doing their modernizing with the most modern press of all ... can today tell you about accomplishments with this newest and greatest of OBIs that you would have never dreamed possible. Yes, the press that Niagara conceived to do more than any OBI ever built is doing just that for a fast-growing list of metalworking plants.

There's a huge fund of successful experiences that a Niagara representative can share with you today. Draw on it now and utilize it in your modernization plans. Make a date, at your convenience, for a personal call.

... and if you haven't received new Bulletin 56 with complete design description and specifications (75-200 ton capacities, 4½-7½ inch shaft diameters, standard and automated models) write for your copy at once. You will find it invaluable to your planning.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N.Y.

DISTRICT OFFICES:

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Distributors in principal U. S. cities and major foreign countries

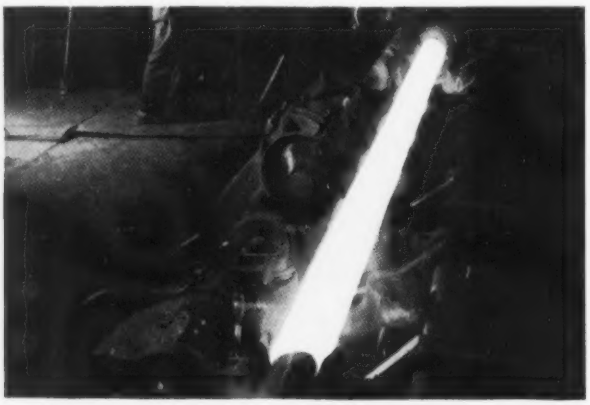
•

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work

NIAGARA

front-to-back crankshaft INCLINABLE PRESSES

Backbone of a



THE SEAMLESS METHOD of manufacture is one of the most difficult forging operations in the steel industry. A billet of the finest steel is actually pierced to produce a seamless tube with absolutely uniform wall strength. No welds . . . no joints . . . no weaknesses.

SUN PIPE LINE COMPANY'S new 110-mile line from Twin Oaks, Pa., to Newark, N. J., doubles the company's delivery capacity of petroleum products to the vital New York area. Consisting of 10,951 tons of 14"-diameter NATIONAL Seamless Pipe, the line can handle more than 83,000 barrels of gasoline or 65,000 barrels of fuel oil every day.

UNITED STATES STEEL

Hundred Industries

NATIONAL SEAMLESS PIPE AND TUBES

Whether you are outfitting ships with high-pressure power piping, or manufacturing tubular-shaped mechanical parts, you'll want pipe and tubes that possess great strength . . . insure long life and complete dependability. In other words, you'll want USS NATIONAL Seamless Pipe and Tubes.

NATIONAL Seamless combines to the highest degree such vital qualities as strength, safety and workability. Uniform throughout and dimensionally accurate, NATIONAL Seamless Pipe and Tubes provide smooth installation and long, satisfactory service. Available in a complete range of steel analyses, wall thicknesses and diameters, every foot is produced to exacting standards by the world's largest manufacturer of tubular steel products.

We'd like to help you fit NATIONAL Seamless to your manufacturing specifications. Get in touch with us. Our engineering staff is at your service.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

NATIONAL SEAMLESS PIPE AND TUBES

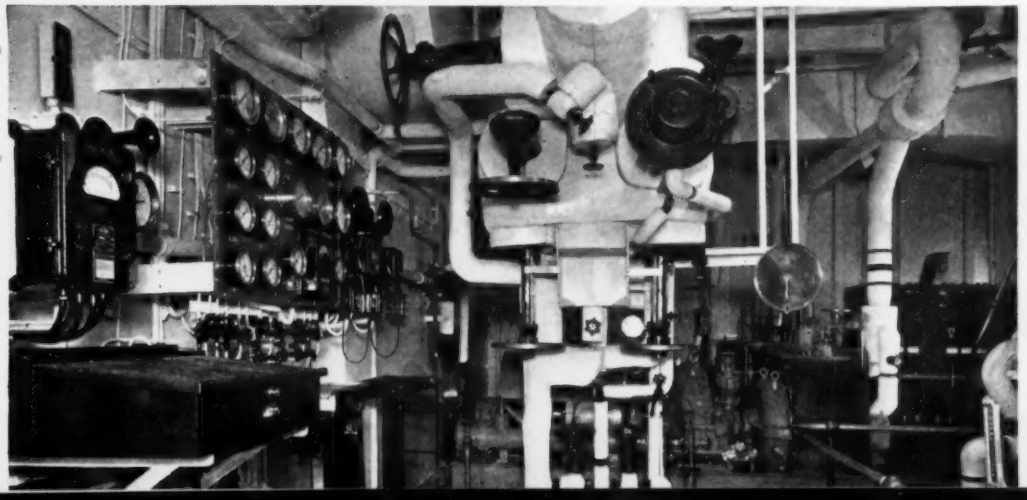
WALLS WITHOUT WELDS

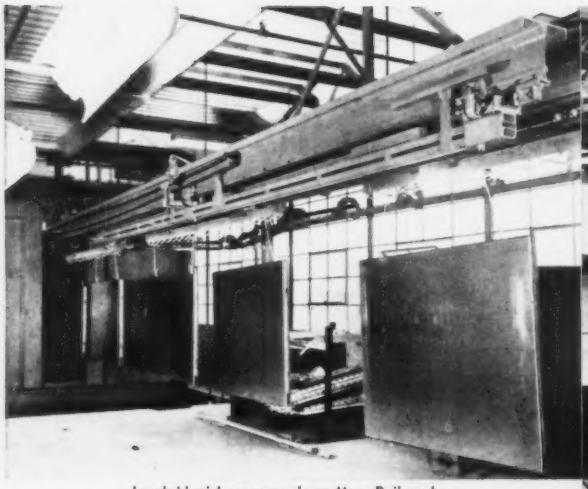
Watch the **United States Steel** Hour on TV every other Wednesday (10 p.m. Eastern time).

LARGEST AIR-CONDITIONED OFFICE BUILDING ever built—New York's Socony-Mobil Building—used approximately 470 tons of NATIONAL Seamless Pipe in the construction of its vast air-conditioning and heating systems. The stainless-steel-sheathed structure also incorporated 350 tons of NATIONAL Seamless into its intricate plumbing system.

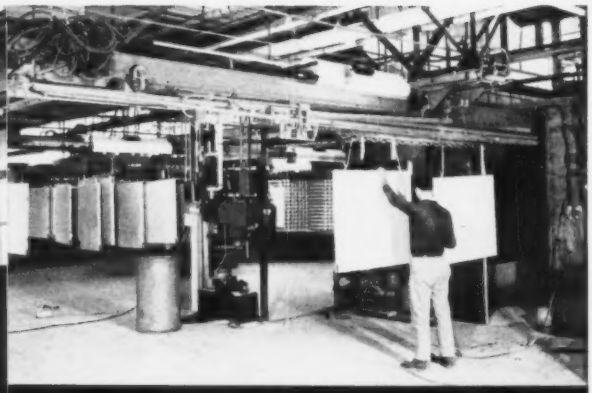
TO WITHSTAND CORROSION and 100 MPH winds, this Coaxial Colinear Antenna is supported by a mast of Shelby Seamless Tubing, running through its center. Made of stainless steel, the mast possesses extremely high tensile strength, and will not flake from oxidation—a common cause of short circuits.

IN THE HULLS OF SHIPS, NATIONAL Seamless Marine Pipes and Tubing provide the ultimate in safety and dependability—transmit steam at high temperatures and intense pressures, crossing after crossing, year after year. Tough, strong, uniform—NATIONAL Seamless is ideal for any marine power piping system.

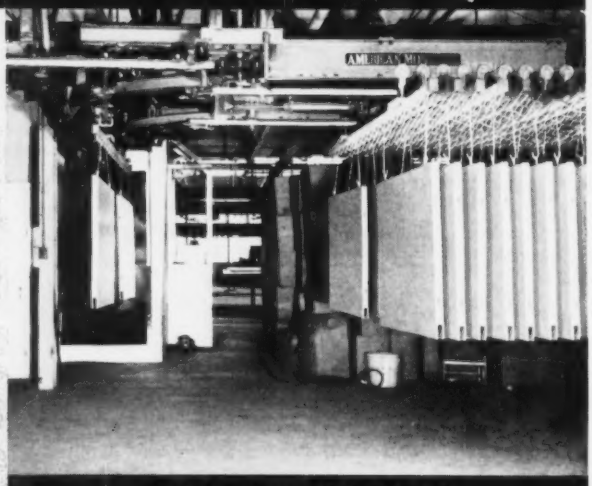




Landahl picks up panels as MonoRail pushes them from degreasing



MonoRail pneumatically pushes a "car" of panels into a finish spray booth.



Finished panels are pushed by MonoRail from the bake oven.

Automatic Finishing with Power LANDAHL and AMERICAN MONORAIL

Space was saved and automatic finishing achieved by combining two overhead handling systems.

American MonoRail cars carrying metal panels move through degreasing, priming, finishing and baking. In each operation either loading or unloading is performed automatically by power — the Landahl Chainless Conveyor acting as a "pusher" over most of the system.

Here is "team work" engineering to take advantage of the flexibility of both American MonoRail and Landahl Chainless Conveyors.

This efficient system is installed at Fostoria, Mfg. Co., Fostoria, Ohio, for finishing metal panels for office partitions.

For details on how American MonoRail or Landahl Conveyors can cut your handling costs, write today.

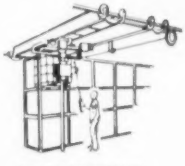
Member of The Materials Handling Institute, Inc. & MonoRail Manufacturers' Association.

For Power Driven Conveyors, Use Landahl Chainless Conveyors

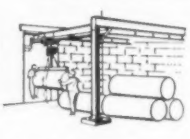
AMERICAN
MONORAIL
COMPANY

13103 ATHENS AVENUE, CLEVELAND 7, OHIO (IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

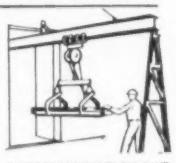
AUTOMATIC DISPATCH



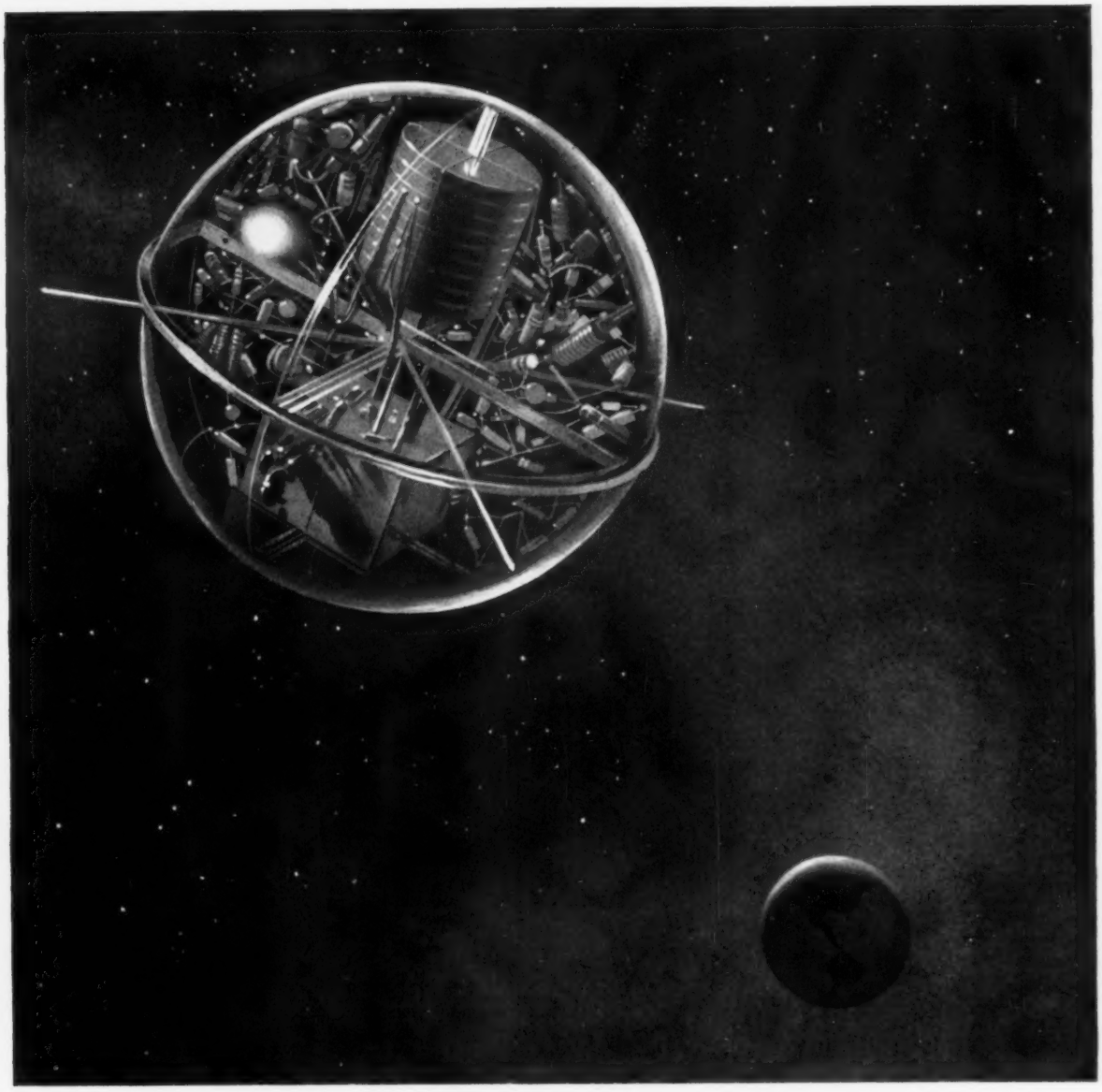
STACKER CRANE



MANUAL MONORAIL



RETRACTABLE CRANE



Putting a voice in the man-made moon

America's first man-made satellite will soon be launched into outer space where, traveling in its own orbit, it will circle the earth.

Deep inside will be sensitive electronic instruments which will "observe" cosmic activity and "report" findings back to us. Scientists believe that many a mystery of the universe may thus be solved.

Without electrical insulation of exceptional qualities, such as CDF supplies, the equipment inside these man-made moons could never operate.

FOR SPECIFIC INFORMATION on CDF products, see Sweet's, Electronics Buyers' Guide, and other directories. Then send us your print or your problem, and we'll return free samples and technical literature.

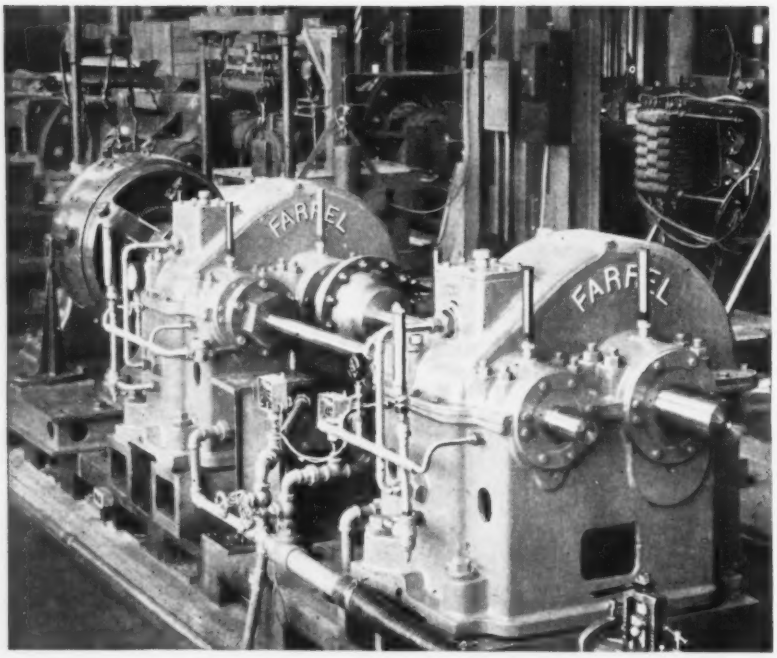
CDF MAKES Dilecto Laminated Plastics • Celoron and Polyester-Glass Molded Plastics • Micabond Mica Products • Diamond Vulcanized Fibre • Flexible Tapes of Teflon*, Silicone, and Micabond • Resin-Impregnated Spiral Tubing • *Complete Fabrication Facilities.*

*duPont trademark for its tetrafluoroethylene resin

CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Budd COMPANY • NEWARK 85, DEL.

Farrel® speed reducers get a physical checkup

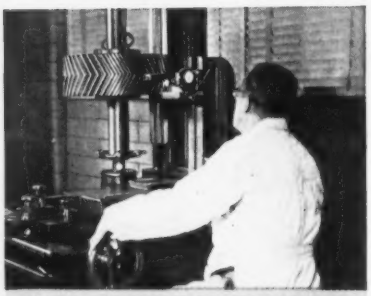


Setup for testing two high-speed units to observe performance under various conditions of load and speed.

Recently, the Farrel line of speed reducers was re-engineered, rerated and expanded to increase the horsepower in relation to size, and to extend the advantages of the units to additional applications.

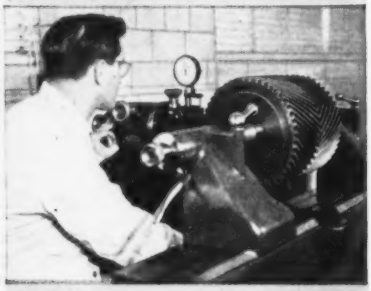
A vital phase of this program was the physical research involved. The many improvements and consistent high quality found in the new line are a result of exhaustive experimentation which was carried on in connection with every aspect of speed reducer manufacture. Pictured here, are some of the facilities and equipment employed in the Farrel laboratory and shops for checking and testing gear units.

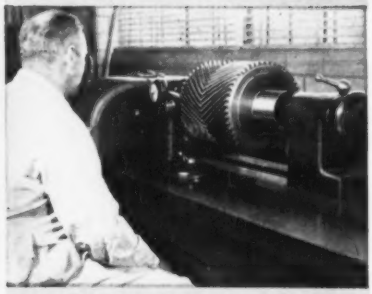
Toughness... stamina... long life ... these are the qualities of Farrel units which stem from the sound design, the high-grade materials, and the step-by-step precision that go into their making. Investigate the broad new line of Farrel speed reducers. For further details, send for a copy of Bulletin 450.



▲ Involute tooth checker for measuring accuracy of profile.

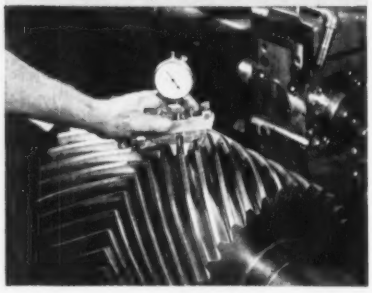
▼ Checking accuracy of tooth spacing.

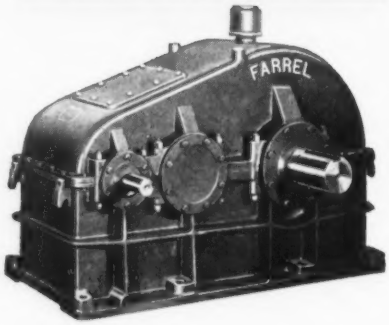




▲ Checking helix angle or lead.

▼ Accuracy and uniformity of tooth thickness is checked with Farrel comparator.





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ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
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SCREWSTICK offers Assembly Savings Better than 4 to 1

SCREWSTICK is easy to insert into power driver, lets you drive a fastener as fast as you can find the hole.

SCREWSTICK saves money. It can cut assembly costs by as much as 4 to 1

It can do this because SCREWSTICK feeds fasteners automatically from a power driver in a one-piece stick of identical fasteners. It eliminates manual handling of small screws, stops costly fumbling and combines high fastening strength with quick assembly.

Just as important is the ease of alignment between the screw and threaded hole and a constant, measured torque which is built into the product that provides uniform tightening.

SCREWSTICK is readily adaptable to compact, lightweight, portable drivers. Sizes from No. 0 to No. 6 in diameter, custom-engineered in machine screw or self-tapping types to meet your own requirements. They are mass-produced in the convenient, easy-to-handle SCREWSTICK form.

Find out for yourself how you can apply precision and ease of assembly to reduce assembly costs. Take advantage of American's custom engineering service for your fastening applications.

The biggest news in fasteners comes from . .

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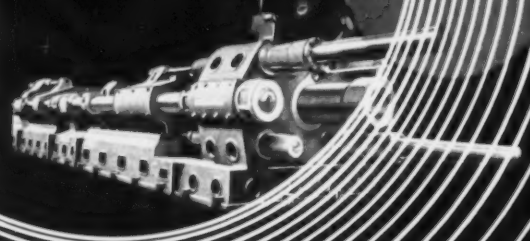
seamless tube mills

INNOCENTI



1350 t. piercing press

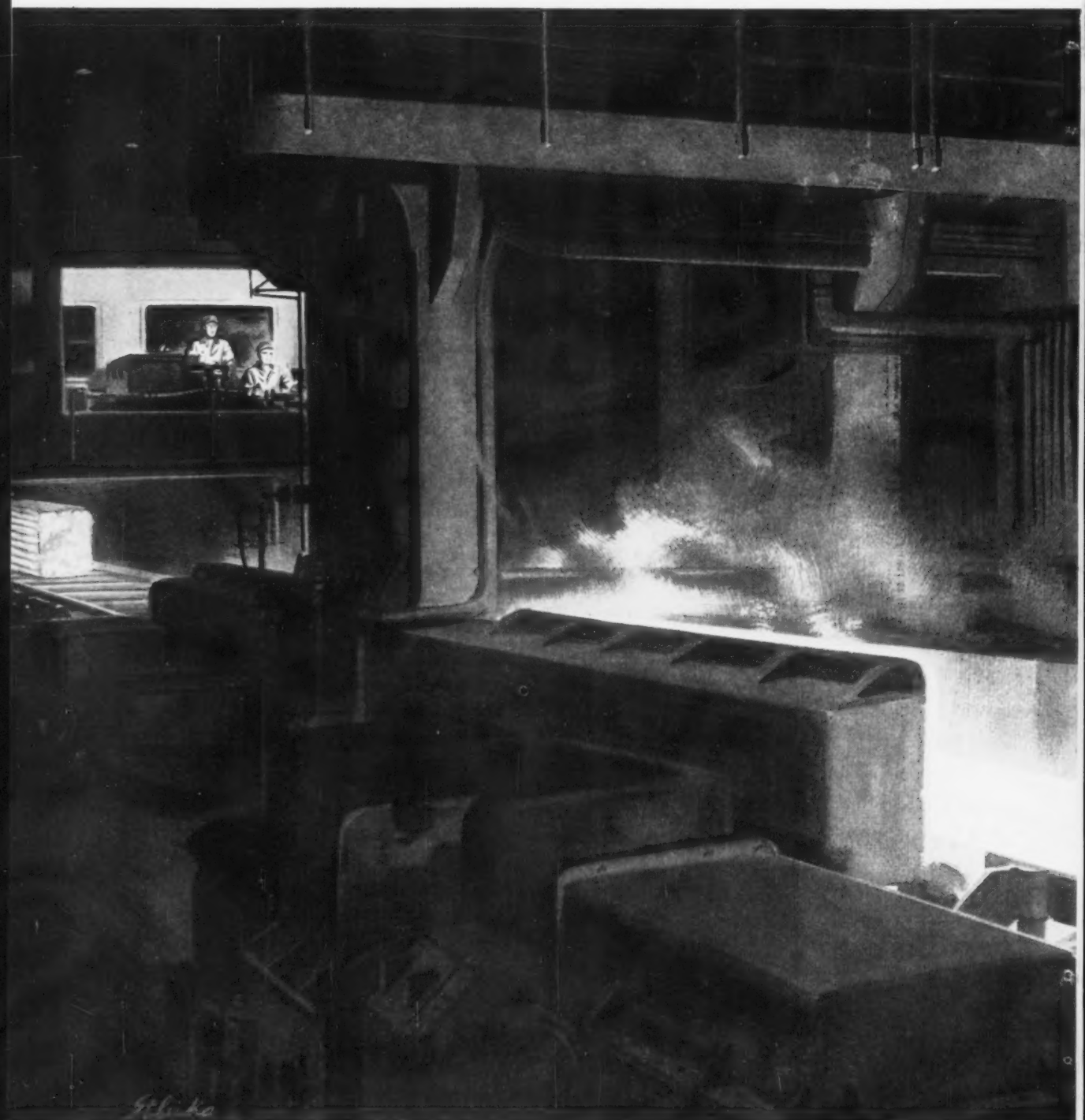
INNOCENTI

CWB-Milling & Boring Machine

works in Milan (Italy)

Bertani

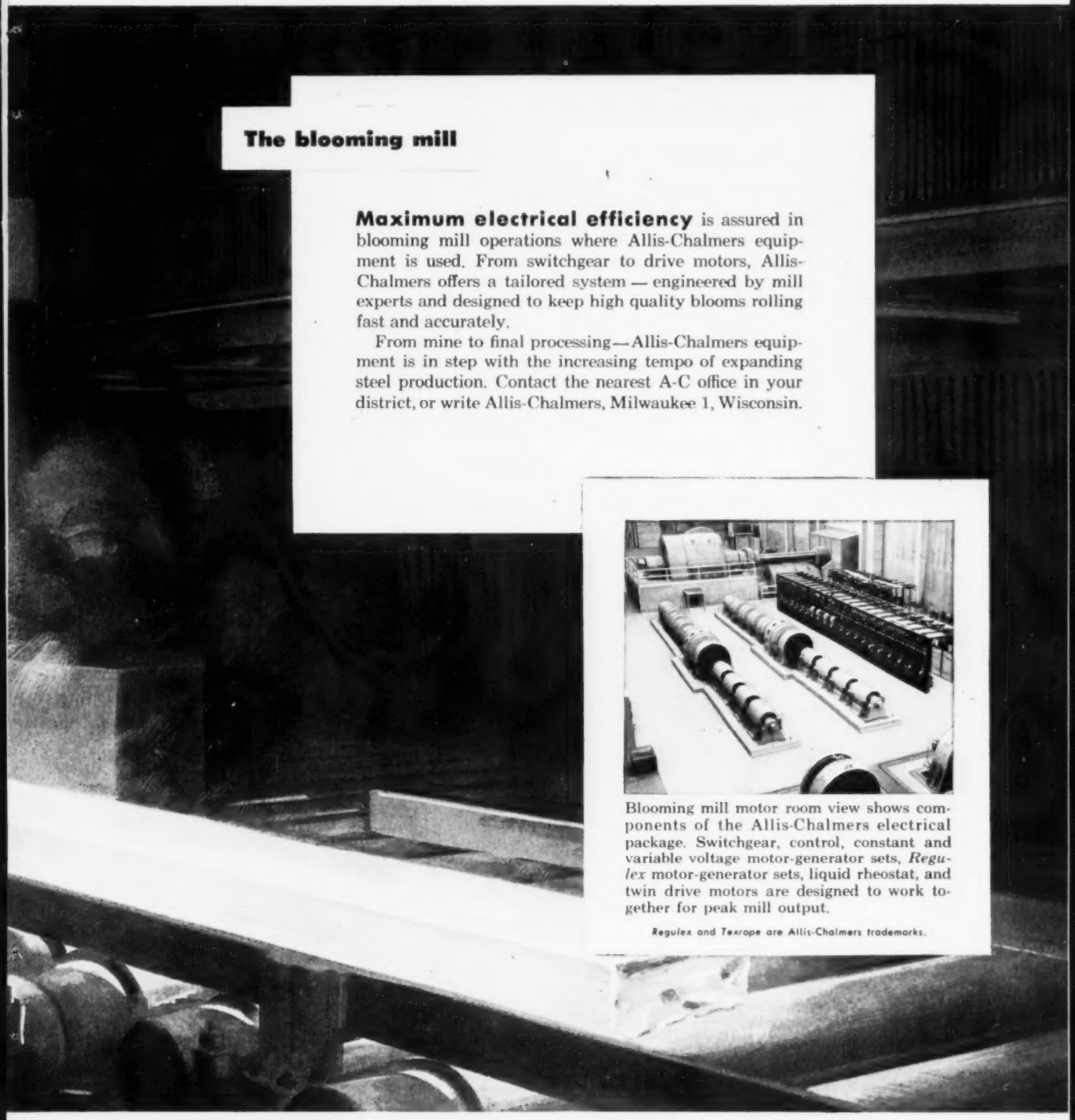
ALLIS-CHALMERS . .



Products for steel: motors, m-g sets, rectifiers, control, pumps, *Texrope* drive equipment, crushers, grinding mills, screens, transformers, unit substations, switchgear, circuit breakers, turbine-generators, voltage regulators, blowers, compressors, condensers, and water conditioning equipment.

ALLIS-

in Step with STEEL



The blooming mill

Maximum electrical efficiency is assured in blooming mill operations where Allis-Chalmers equipment is used. From switchgear to drive motors, Allis-Chalmers offers a tailored system — engineered by mill experts and designed to keep high quality blooms rolling fast and accurately.

From mine to final processing—Allis-Chalmers equipment is in step with the increasing tempo of expanding steel production. Contact the nearest A-C office in your district, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

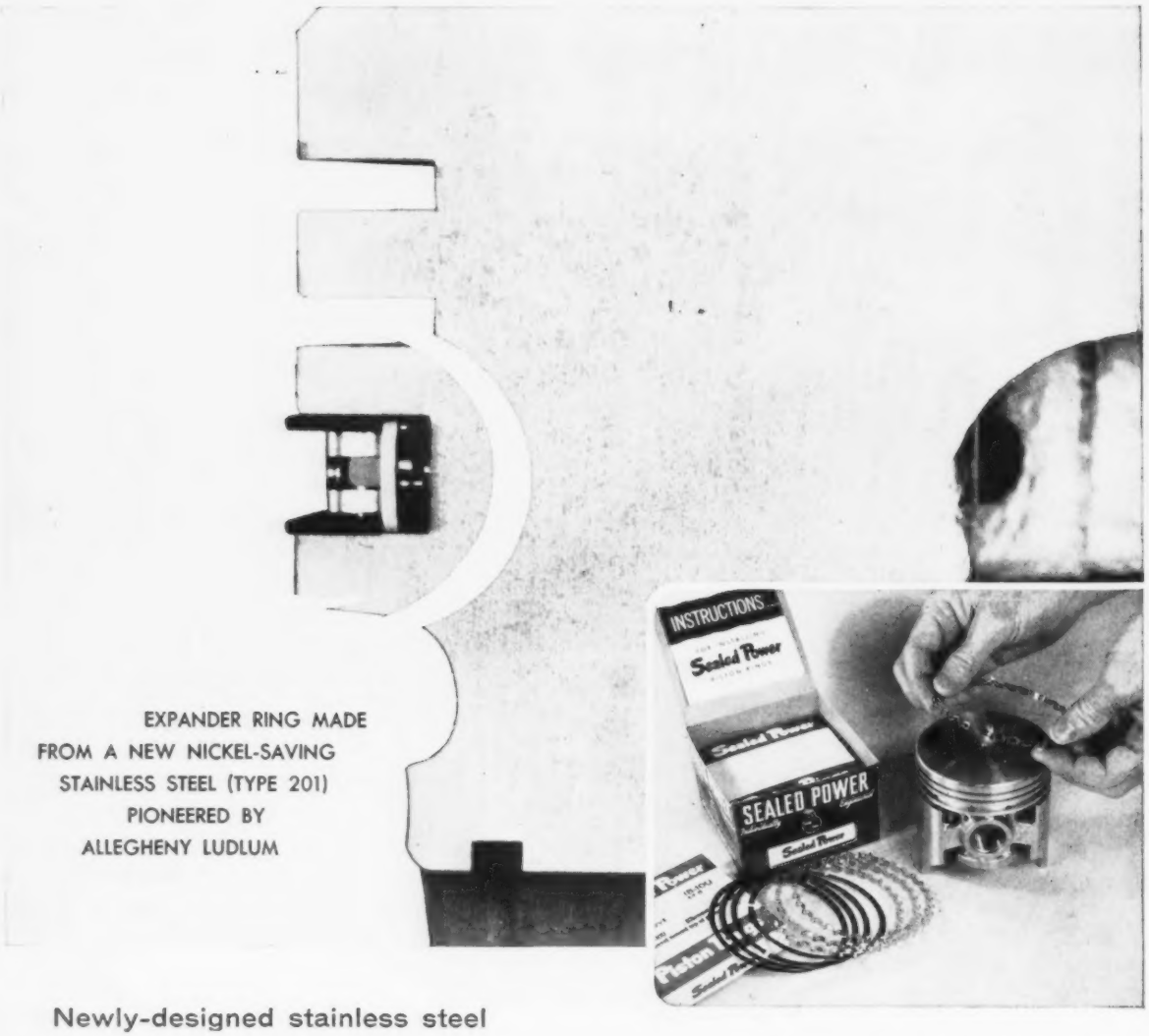
Blooming mill motor room view shows components of the Allis-Chalmers electrical package. Switchgear, control, constant and variable voltage motor-generator sets, *Regulex* motor-generator sets, liquid rheostat, and twin drive motors are designed to work together for peak mill output.

Regulex and *Texrope* are Allis-Chalmers trademarks.

CHALMERS

A-C ALLIS-CHALMERS

A-5411



EXPANDER RING MADE FROM A NEW NICKEL-SAVING STAINLESS STEEL (TYPE 201) PIONEERED BY ALLEGHENY LUDLUM

Newly-designed stainless steel

OIL RING ASSEMBLY gives auto drivers 3-WAY ADVANTAGE

BETTER OIL ECONOMY

BETTER ENGINE PROTECTION

LONGER ENGINE LIFE

Oil rings do a very demanding job in an automobile engine. They control the amount of lubricant allowed to pass up to the compression rings and cylinder walls. In modern cars, with higher compression ratios, the tension of the oil ring expanders has had to be increased—and that's where Allegheny Type 201 stainless offers advantages.

Engine operating temperatures have virtually no effect on this new stainless alloy. It maintains constant tension whether the engine is hot or cold, permitting most efficient design for maximum flow of lubricant when friction is greatest, and less flow when the engine is warmed up and requires less. Formerly, carbon steel expander rings suffered a tension drop when heated to engine operating temperature. Then under heat they took a permanent set, which caused the loss of "cold tension." Allegheny 201 also has ended the problem of expander breakage due to the corrosive action of engine deposits.

This success story is just one of many being written with the new 200-series of low-nickel Allegheny Stainless Steels. Fabricating methods are virtually the same as with the higher-nickel 300-series, but you'll find some advantage in cost, and much greater availability in times of nickel shortage. • If these new steels seem to fit into your manufacturing or service picture, give us a call. *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.* WSW 6526

WRITE for a copy of our "Technical Horizons" bulletin on the Allegheny 200-Series stainless steels.

ADDRESS DEPT: A-901

Make it BETTER—and LONGER LASTING—with

Allegheny Stainless ®

AL ALLEGHENY LUDLUM

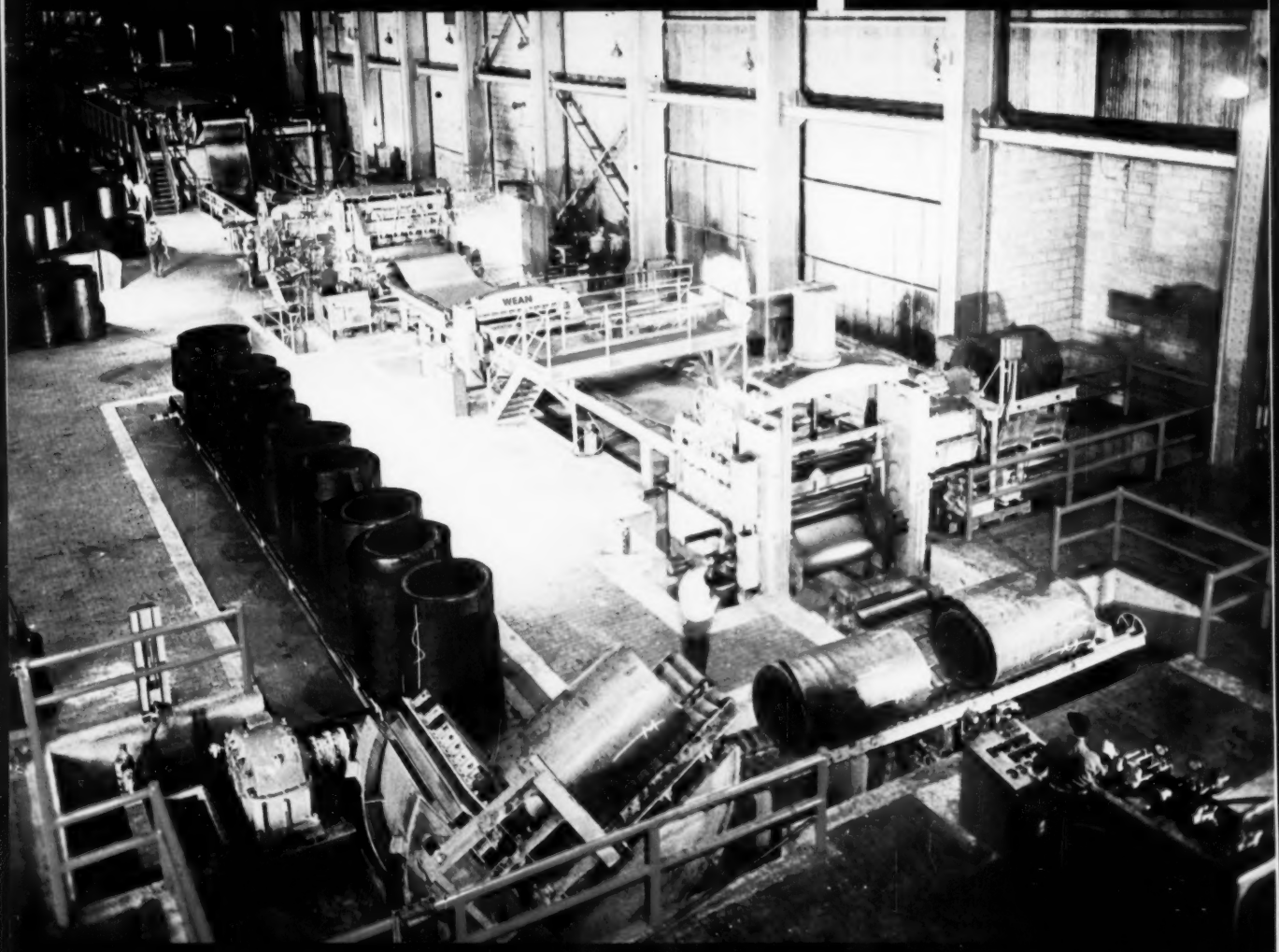
Warehouse stocks carried by all Ryerson steel plants

Wean, "J&L" and Pickling

● One important factor in the successful design of Wean Continuous Strip Pickling Lines is the utilization of automatic equipment wherever possible in order to achieve highest tonnage production at lowest cost. For example:

In 1951, when increased production at Jones & Laughlin's Cleveland plant created a need for greater strip pickling capacity, Wean designed and constructed an 80" continuous strip pickling line which met or exceeded all requirements. In fact, results were so satisfactory that when continually rising production necessitated additional strip pickling facilities, "J & L" again called on Wean to furnish a second line to meet this increased demand.

This story is repeated wherever Wean-Engineered pickling lines are installed; higher tonnage production — minimum maintenance — lower operating costs . . . but above all, complete customer satisfaction.



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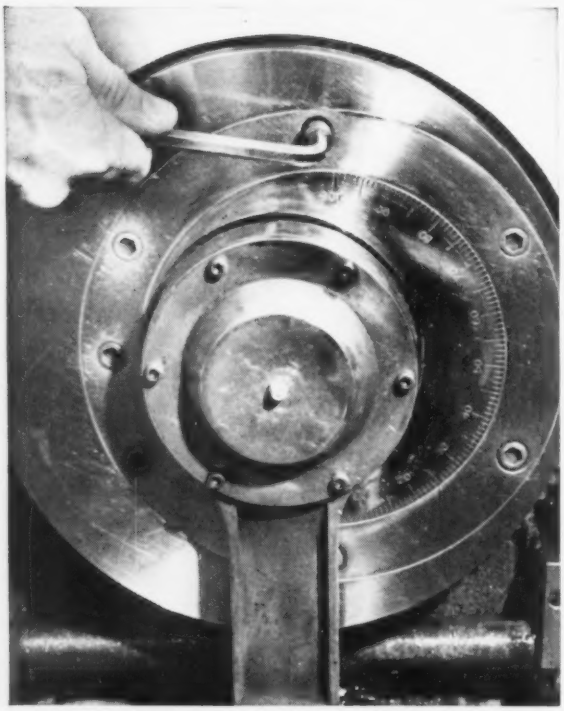
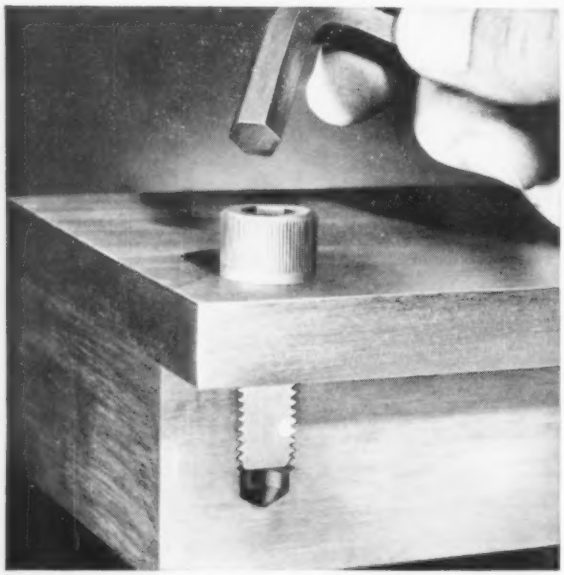
THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO



Self-locking UNBRAKO socket screws keep critical adjustments secure in the eccentric drive mechanism of this fatigue testing machine. Drive system delivers varying loads up to 15,000 pounds force to equipment under test at 1050 cycles per minute.

Vibration won't loosen Self-locking UNBRAKO socket cap screws

Screws with Nylok* device permit adjustments, keep precise settings during long test runs



HOW IT LOCKS. The tough, resilient Nylok locking pellet keys itself into the mating threads. It forces threads together, and locks the screw securely—whether or not the screw is seated.

UNBRAKO socket screws with the Nylok self-locking device stay tight under constant vibration.

Take the eccentric drive system in the fatigue testing machine illustrated above, for example. This machine must frequently run for periods up to 2 weeks or longer, day and night, to complete a single test. Loosening of the screws which are used to adjust the tension-setting mechanism could not only cause damage to the machine, but also make the test data worthless. Self-locking UNBRAKO socket head cap screws eliminate such problems.

An UNBRAKO socket screw with the Nylok self-locking device is a single unit. Just screw it into any tapped hole. Seated or not, it locks positively wherever wrenching stops. Constant vibration or pounding, or endless running of a machine, won't affect these self-locking UNBRAKOS. The screws will not work loose!

Write today for your copy of Form 2193, which gives complete catalog and technical data on the entire line of UNBRAKO socket screws with the Nylok self-locking device. Or see your authorized industrial distributor. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

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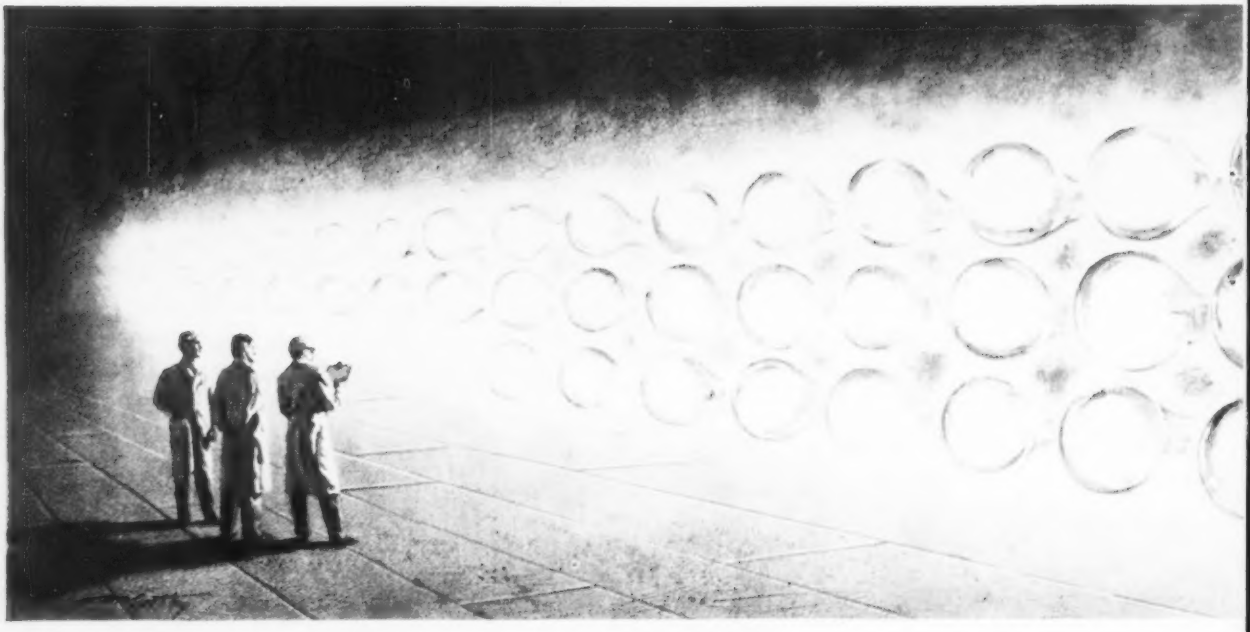

This year Norton will use over

533 million KWH to bring

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15 HP was News! In 1886 Norton Company astounded New England industry when it installed a 15 HP motor to modernize its manufacture. Last year Norton opened new plants in California, Alabama and three foreign countries to fill industry's needs.

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Each Light Bulb represents 10 million KWH used by Norton Company plants throughout the world in making its abrasives and other Norton products in a single year.

industry the "Touch of Gold"

The now famous Norton "Touch of Gold" is no Midas magic. It is much more complex than that. And, of course, infinitely more certain and more lasting.

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QUALITY CONTROL REPORT

These sparks reveal vital facts about quality control of steel

You are naturally interested in the quality of your finished products—and if you use steel in making them, you should know about the Ryerson quality controls symbolized by this spark test.

Here a skilled Ryerson inspector is checking the carbon content of a steel bar by "reading" the sparks thrown off by an abrasive wheel. It's an amazingly accurate method of making sure that you get exactly the steel you order.

And this is only one of many rigid quality controls that protect you in every purchase of steel from Ryerson stocks. For example, a heat symbol identifies every bar of alloy steel to avoid the problem of variation from heat to heat. Another example: cylinder tubing can be furnished to more accurate inside diameter through Ryerson specs controlling O.D. and I.D. instead of O.D. and wall.

The result: steel of certified quality—assured by exacting Ryerson controls, whether your product calls for carbon, alloy or stainless steels. And these quality controls become *your* quality controls in your finished product.

These are important points to remember when you specify or purchase steel. You get extra value every time you order from your nearby Ryerson plant.

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Aircraft Cutback Due

The Air Force indicates its cutback in plane procurement is only a few months away. A top official expects "vigorous" competition among aircraft producers for the fewer dollars that will be available after July 1. Emphasis in the next fiscal year will be on modernizing and improving a shrinking number of combat air wings, plus some step up in missile purchasing.

Three-Plane Micrometer

A new direct reading optical micrometer will locate points in three dimensions on large machined surfaces. It exerts no pressure on the object being measured and can be adapted to a machine tool to take readings without removing the workpiece. Overall accuracy rating is ± 0.0001 in.

Modify Nodular Iron

High resistance to oxidation at temperatures above 1500°F and resistance to thermal shock and distortion are properties claimed for a modified nodular iron alloy. What's more, the alloy requires only small amounts of inexpensive, non-strategic ingredients. Present compositions need large quantities of costly and critical alloy additions to yield high-heat strength.

Grill Dave McDonald, Too?

Senate labor probers still don't know whether they'll call United Steel Workers boss Dave McDonald into their public hearing spotlight. Staff investigators are checking his recent successful—but close—battle for re-election. Sen. McClellan's Rackets Committee has received some 20 complaints alleging McDonald was voted in with union money.

What Cuts Creep Strength?

Why do aluminum deoxidized carbon steels have lower creep strengths than those deoxidized with silicon? Studies show that it's an indirect effect dependent on distribution of about 0.005 pct nitrogen in the steel. When aluminum removes nitrogen from solid solution in the form of aluminum nitride, the creep strength drops. Remedy: A high temperature heat treatment to break up the aluminum nitride.

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Temperatures ranging from —420° to 1000°F won't affect the holding power of a new refractory cement for bonding metal to metal, glass or ceramics, it's claimed. The new adhesive is dielectric, highly shock-resistant, waterproof and nonhydroscopic. Because it stays slightly malleable after it dries, it's said not to craze, crack or check.

Improve Sand Testing

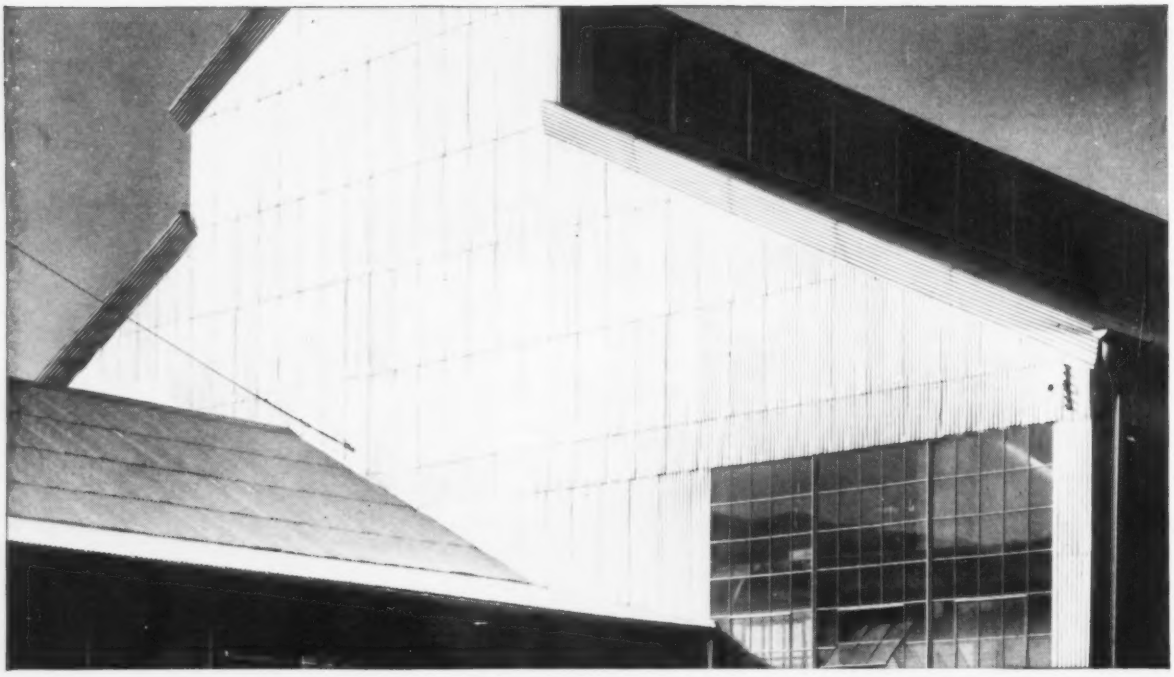
Having trouble with inconsistent results from tensile and transverse bend tests of shell molds or core sands? Army research has produced a new design for tensile test briquettes. It minimizes the concentration of stresses at the critical testing zone. All sands tested according to the new technique showed a higher apparent tensile strength, and reproducibility was improved for rammed resin and oil-bonded sands.

Scrap Market Uneasy

Midwest scrap dealers are getting nervous about their stocks, even though they're holding out for high broker buying prices. First uneasiness seems to be hitting blast furnace grades, perhaps because further furnace shutdowns in that area are in the wind. In Pittsburgh, major mills are still operating 39 out of 43 blast furnaces, although the small demand for turnings indicates the furnaces are not being pushed very hard.

Weld Magnesium Faster

Elimination of the "burn-back" problem in machine welding of magnesium is said to be possible with a shielded inert arc, consumable electrode process. The new method is automatic and continuous, and produces 30-ft long welds as a matter of routine. Exceptional results are reported in welding heavy sections such as are found in plate, structural shapes and castings.



PAINT STAYS ON the metal of this galvanized building. The roofing and siding were treated with ACP Lithoform before painting. No peeling of the paint finish has occurred and it will last much longer.

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LITHOFORM PROCESS	Type of Coating	Metal Treated	Object of Coating	Method of Application	Government Specifications
LITHOFORM 32	Zinc phosphate	Zinc or cadmium	Improved paint adhesion	Spray Dip	MIL-T-12879 (QMC) Type 1, Class 1 QQ-P-416, Type III QQ-Z-325, Type III
LITHOFORM 40	Zinc phosphate	Zinc and steel when combined	Improved paint adhesion	Spray Dip	MIL-T-12879 (QMC) Type 1, Class 1 PA-PD-191 (Rev. 1) (purchase description) QQ-P-416, Type III QQ-Z-325, Type III
LITHOFORM Z	Amorphous chromate	Zinc or cadmium	Improved paint adhesion corrosion resistance unpainted	Spray Dip	MIL-C-17711 (N Ord.) MIL-T-12879 (QMC) Type 1, Class 2; Type II QQ-P-416, Type II QQ-Z-325, Type II U. S. A. 57-0-2C Type I (plating)
LITHOFORM 2	Zinc phosphate	Zinc	Improved paint adhesion	Brush	

There's no peeling of paint from galvanized iron, other zinc surfaces, or cadmium when they are first treated with Lithoform. This ACP product forms a non-metallic coating which becomes an integral part of the surface, resulting in an excellent bond for the paint finish and preventing any undesirable chemical reaction between metal and paint film.

LEARN MORE ABOUT ACP LITHOFORM. Bulletin 1481 describes the various types and gives helpful information which will help you select the proper one for your particular application. Write for your copy today

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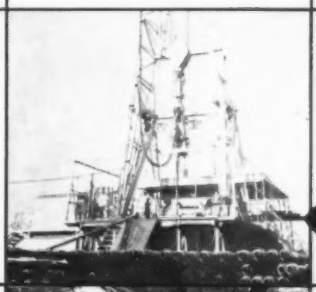
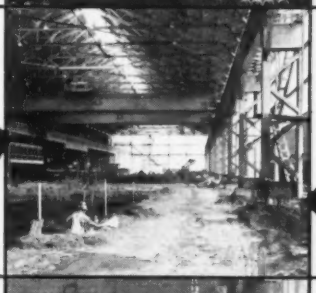
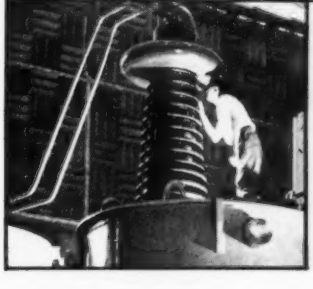
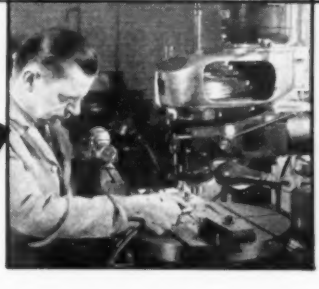








■ SPECIAL REPORT

Second Half Outlook: Metalworking's Markets Tighten

More Spending Goes to Services

Consumers' durables are losing ground in spending plans. Bigger gains are registered in nondurables and services.

But most business looks for a second half as good as the first six months and one of the best years on record.

■ Metalworking's big problem at mid-year is getting a bigger share of the consumer's dollar.

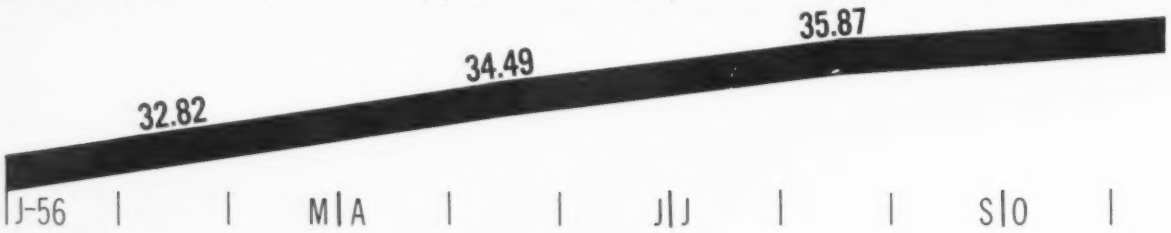
Lost in the shuffle of complaints about tight money, higher prices, and conventional mutterings, is the fact that consumer spending has not fallen off, or even leveled off.

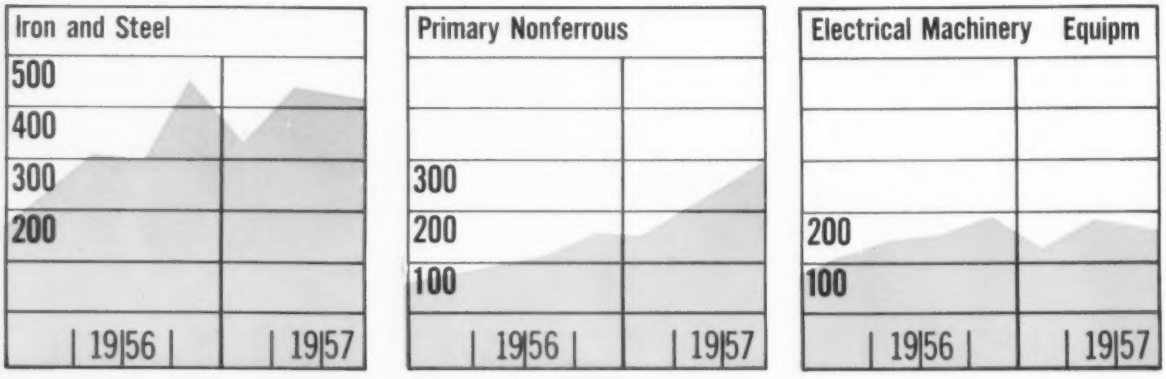
What isn't generally considered is that spending for durable goods has given way while spending for nondurables and services has increased.

Durables Down $1 Billion—In the past year, spending for consumer durables, metalworking's greatest strength, has declined nearly $1 billion. Expenditures for

Capital Goods Spending Plans

Quarterly Expenditures for New Plant and Equipment Seasonally adjusted at Annual Rate, in Billions of Dollars





Metalworking's Capital Goods Spending Quarterly Spending (In Millions of Dollars)

services gained almost $8 billion; nondurable goods nearly $6 billion.

By simple arithmetic, total consumer spending has gained a full $13 billion in the past year, but products which take the bulk of metalworking's output were off.

As the Chamber of Commerce's Business and Economic Outlook understates it: "Such shifts are little consolation to those engaged in durables production and distribution."

Some Are Spotty—This accounts for the somewhat spotty forecasts for metalworking at the mid-point of a year that will be one of the best in economic history.

Look down the list of major metalworking industries and markets, and you will note those with less optimistic outlooks for the rest of the year tend to be in consumer durables. And some of the forecasts tend to be tempered by the traditional salesman's optimism.

Economists hesitate to predict whether this trend to greater spending for nondurables and services will be long term or short lived; a plateau in spending for cars until highways are improved, for appliances until money eases, or greater demand restores the high rate of new home buildings.

Most Look Good—General outlook for the remainder of 1957 is encouraging. There are some weak spots, true. But these tend to be only in comparison with record years of the recent past, and don't necessarily indicate a weak market in the broad sense.

Overall business will continue good throughout the second half. Defense, and other government spending, will continue to be a big factor in keeping gross national product at a level rate, with some slight increase.

Even those three big question marks of the consumer market, appliances, automotive, and farm equipment are making sounds that may indicate better a second half. But they will have to prove it with better records than seem likely, at this point.

Capital Spending Up—Business in general is encouraged by a recent survey report of the Securities and Exchange Commission (see charts) that indicates businessmen will increase outlays for new plants and equipment through the third quarter.

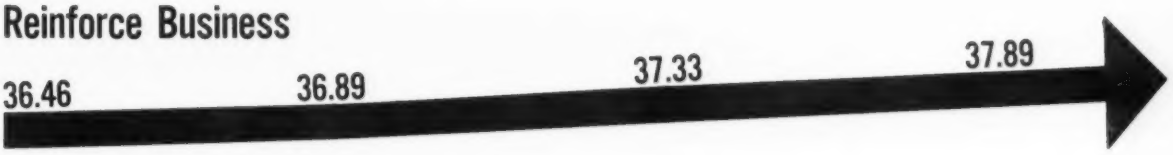
It should be an accepted fact that capital spending has been the big factor in maintaining the record rate of business in a period when such stalwarts of the economy as automotive have had less than satisfactory years.

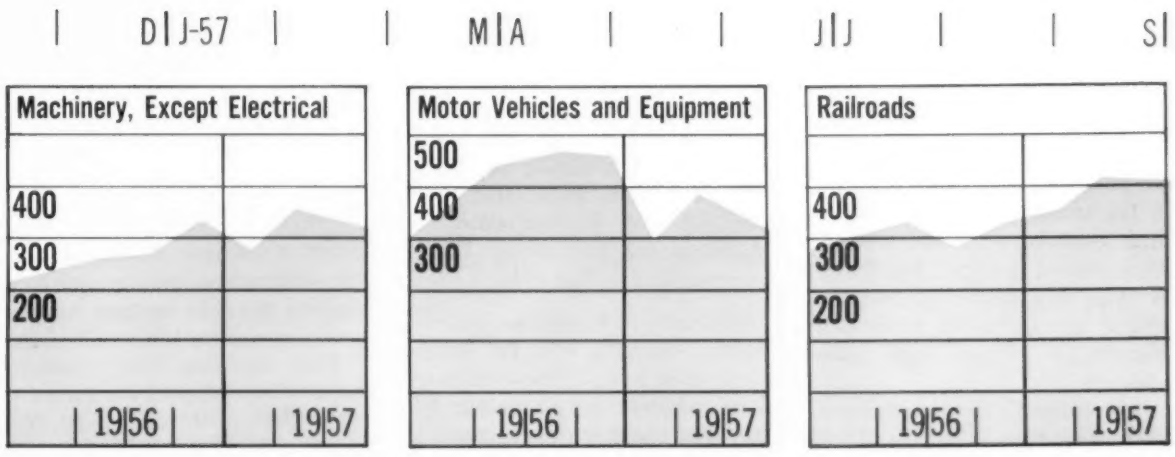
"While the current advance is not so great as that experienced in 1955-56," the report states, "the modest upward trend at such a high level continues to be an element of strength in the business situation."

Seasonal Trends—As businessmen turn to the second half of 1957, they are encouraged by a relatively new development in business: Second halves no longer necessarily show significant declines.

The trend to a good second half has been in evidence for several

Reinforce Business





years, but businessmen have been slow to recognize it. As a result, the automotive industry now expects its biggest production months in early winter, instead of spring as previously. Other businesses are noting similar seasonal switches.

Editor's Roundup — To get a broad look at metalworking's position at mid-year, IRON AGE editors polled executives in all branches of metalworking. They found most in an optimistic mood for the second half, with few fears and apprehensions.

But there are two general causes of slight concern: Tight money, and the general conclusion that higher prices are coming.

Tight money hits metalworking in two ways.

First, there's the company that wants to borrow for new equipment needed to compete in its own field, or possibly to extend its markets in another direction.

Second, there's the maker of capital goods who believes many of his potential customers would like to place orders, but find financing either impossible to get, or too expensive.

Price Problem—Prices are the concern of almost every metalworking executive. Everybody knows that steel prices are going up shortly after the July 1 automatic pay increase. There's no indication that aluminum producers intend to absorb more than a small part of the wage raise that will go to workers August 1.

Many other industries, like autos, also face or have granted substantial labor cost increases this summer. In competitive markets, there will be much pressure to absorb all or part of these costs.

IRON AGE editors found little inclination to do so, encountered general feeling that a substantial part of higher costs will be passed on. This attitude could change when the actual situation arises. But sentiment is strong against accepting higher costs.

Evaluations of the metalworking outlook for cross sections of metalworking and its markets:

Automotive — Optimism that bubbled forth from executives six months ago has faded, but possibly not as much as generally believed.

Two of the Big Three, Ford and Chrysler, have gained ground in their battles for a greater share of the market. (Automotive, p. 68.) General Motors has been the big loser. American Motors and Studebaker-Packard continue to lose ground.

Consensus is that 1957 output will roughly parallel 1956. But the second half will be characterized by cutbacks in production for dealer cleanups, then shutdowns for changeovers. The outgoing months of the second half will see the new model upsurge, but the summer months will be disappointing.

Big hope among the new models will be the entirely new Chevrolet, out to recapture the production leadership. Ford Motor Co.'s Edsel will be the big attention getter. Otherwise, only Pontiac will be

Tight money is a problem. But nobody admits curtailing expansion because of a critical cash shortage.

completely new, with most presenting varying degrees of facelifts.

Aircraft—The West Coast aircraft industry points to employment up 73,000 from a year ago, highest since the end of World War II; and a giant $9 billion military and commerical backlog, up from last year's $8 billion.

The steadily rising surge of aircraft employment should level off from now to year-end. But Boeing is hiring at a stepped-up pace that reflects the increasing business in commercial jetliners and guided missiles.

The military's threatened change in emphasis from jets to guided missiles in a revised defense concept will not be felt by either aircraft or its suppliers this year.

Machine Tools—Shipments will continue at a high level, probably $850 million for the year. But orders for new machine tools will not be up to that rate in the remainder of 1957. Backlogs at the start of 1956 were equivalent to 6.2 months' output. By mid-year, they were below 5 months. Machine tool producers are cheered, however, by the apparent establishment of a peace-time plateau well above previous peace-time levels.

Optimism is based on machine tool design progress obsoleting older tools, industry expansion, U. S. Government machine tool policies.

Electrical Viewpoint—More revealing than overall industry outlooks are some of these specific reports from individual companies, and occasional executive quotes:

Gwilym A. Price, president and chairman of the board of Westinghouse Electric Corp. says new orders booked in the first quarter were the third largest for any quarter in the company's history. He looks for a record of $2 billion sales for the whole year. He says apparatus, industrial and atomic product backlogs are at a record level.

In regard to steel prices, the company's statement is: "Westinghouse price structure will be examined."

Willard F. Rockwell, president, Rockwell Manufacturing Co., maker of valves, power tools, other products, says 1957 first half orders and shipments will both be up 12 pct over the first half of 1956.

Fabricators Happy — D. B. Straub, secretary, Fort Pitt Bridge Co., structural fabricators, says sales and profits are up considerably from last year. He reports the company has left behind the profit squeeze that resulted from highly competitive bidding in 1954 and 1955. At present, the company is maintaining a backlog of 36,000 tons. There are enough jobs to keep fabricators busy, says Mr. Straub.

Lindbergh Engineering Co., maker of industrial furnaces, reports it is on the way to the highest dollar volume year in company history. It is now picking up from a second quarter slump.

International Harvester Corp. reports its sales in the first half of its fiscal year dropped from $609 billion in 1956 to $553 billion this year. Big drops were in defense work, slow activity in construction equipment lines, and some loss of truck production. A stronger second half is anticipated, and implement and tractor sales are strong and gaining. Improvement in all lines is expected.

Appliance Maker Confident — Norge Div. of Borg-Warner: Judson Sayre, president, expects industry volume to fully equal last year's levels. Norge, one of the nation's top full-line appliance producers, is in a good position. It is notably large in home dryer production, which will be one of the industry's big profit earners in 1957.

A large eastern material handling equipment producer reports its sales have been running five to six pct ahead of last year, and the company expects to hold that level for the remainder of 1957.

Control manufacturers are running about 10 pct behind last year, with little likelihood of catching up. But utility expansion is living up to forecasts, which are about 10 to 15 pct ahead of last year.

Buffalo Pipe & Foundry Co., manufacturer of cast iron pipe and fittings for the construction industry, says its business is off about 20 pct from last year. Officials believe the construction industry will pick up, and that their business will increase at least to last year's levels.

Tube Manifold Corp., Buffalo, manufacturer of parts for the automotive air conditioning field, reports its business is about 40 pct ahead of last year at this time. But things are slowing down now due to slack in the automotive field. But with a pickup after new models are under way, they believe they'll wind up the year 40 pct ahead of last year.

A Cleveland gear manufacturer expects business this year to end up only 10 pct short of last year's record. First half sales are following this trend.

The fasteners market looks slightly better than it did a few weeks ago. Rush orders are coming in from users who cut inventories too far. Some auto customers and their suppliers have been caught short.

Pullman-Standard will have its largest freight car output since 1953. Railroad men comment that most of the current business is coming from western, southern, and midwestern roads. The giants of the East Coast are still holding off

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Behind Scrap's Unexpected Rise

Most of the trade had expected scrap prices to stay down through the summer months.

Here's what happened, and what may happen next, in this most volatile of all markets.—By G. J. McManus.

■ For the second time in six months, scrap prices are defying the law of supply and demand. THE IRON AGE composite price dropped $23 between December and April. It has jumped more than $12 in the past six weeks.

The current market binge is more mystifying than the earlier slump. It comes as steel mills are operating below 90 pct of capacity and in the face of predictions that operating rates will sink to 80 pct or lower in the summer months.

Too Far, Too Fast—The rise has stirred rumors of market manipulation, but its explanation is probably less colorful. The simple fact seems to be that in the first three months of the year prices dropped faster and further than the market justified. The bottom price of about $42 a ton for No. 1 heavy melting was not enough to produce scrap for mill operations between 85 and 90 pct of capacity.

When heavy tonnages were ordered by the mills in the middle of April, the shortage showed up. Brokers began bidding for reduced dealers' stocks. This started the market moving upward. The mills were not getting shipments in sufficient quantity.

Underlying Causes—While these are the basic causes, the violence of recent market swings has been startling. In the initial drop, prices fell over $20 during a period when steel operating rates went down only about 10 points. This was partly a question of scrap men anticipating further drops in steel production.

Also there was a long period when mill buying was abnormally light. One major consumer was out of the market for a month and a half. Others were buying small tonnages of secondary grades.

On top of this, any scrap market movement builds up its own steam. When prices start down, everyone wants to sell. When prices are going up, everyone wants to buy. This tends to exaggerate real supply and demand changes.

What Now?—The question now is whether prices will continue to rise, hold at present level, or decline for the summer months.

One significant fact is that dealers are eager to sell at present prices. Many had not predicted an increase until September, and were holding scrap until the anticipated pickup. But the mills that needed scrap had to pay current prices to get it. If buying continues, prices may ease even further upward. But many expect the summer doldrums to return after the present flurry.

Little Industrial Scrap—In the current rise, a number of causes are suggested for the extra zip of the market. Production scrap output will fall off as automakers get into model changeovers and industry generally gets into vacation slowdowns. Some say the mills have

changed their scrap buying pattern, that they are beginning earlier to stockpile for the winter.

Exports are another question mark. They have been a strong factor not only in coastal areas but inland. Pittsburgh mills used to be able to pull scrap all the way from the Gulf Coast. Today export competition has blocked off Pittsburgh from the whole area below Louisville.

Export Heavy—The government had threatened to shut off exports. For grades calling for licenses, (No. 1 and No. 2 heavy melting), first quarter shipments were 1.66 million tons. At this rate, oversea movements would have nearly doubled last year's tonnage. Japan alone was said to have equalled its total shipments last year with purchases in the first four months of 1957. (See p. 146)

At present the government is negotiating with foreign countries for some sort of voluntary quota system. An interim policy permits shipments equal to those received by a country last year. Japan and the United Kingdom have accepted this policy. The European Steel & Coal Community is said to be dickering for an extra 100,000 tons.

At any rate, it seems certain that scrap exports will continue. This news certainly does not weaken the market.

Outlook for Summer — During July, openhearth operations will probably be down at most mills. This will mean producers can increase the amount of hot metal in the melt. Since the mills generate large quantities of home scrap, a sharp reduction in purchases of dealer scrap will be possible.

However, the mills must begin thinking of winter stocks during the summer. One mill will increase its hot metal charge in July. It will continue buying and charging dealer scrap. It will lay down heavy crops and other types of home scrap.

But whatever the reason, there are signs that some scrap people think their market will either stay strong or will come back quickly if it slumps.

Steel Labor Goes After

Steel workers aim high in demands on small fabricators. But they'll take what they can get.

Second phase of "Big Steel" contracts poses price problems for the mills.

▪ This is an off year for steel labor. Yet the United Steel Workers will be busy negotiating 1200 contracts covering some 200,000 workers. These contracts cover the "small business" outfits in metalworking—the steel and nonferrous fabricators.

In a little-heralded meeting in Washington last week, the union's Wage Policy Committee laid down the objectives for contracts with these companies. On the surface, the demands appear to approximate what the USW obtained from basic steel last year. In reality, the union knows from past experience that it will have to settle for what it can get, in most cases.

Contract Length — The wage policy group made one interesting stipulation for contracts negotiated this year: Maximum duration will be two years. This means that many fabricator contracts will expire about the time that basic steel's three-year agreement terminates in 1959. The question is whether this would work to the advantage of the union while it is negotiating with the big steel companies.

It probably won't make much difference. At least the union says there's no special significance to this stipulation. "Solidarity forever" is the way one union spokesman put it in a facetious moment. It was also pointed out that currently-negotiated contracts will not be for two-year periods in many cases.

"Rule of Reason" — As to whether the union will insist upon imposing the basic steel contract on the fabricators, USW people say that the "rule of reason" will prevail. That is, in many cases, "you can't get blood out of a turnip." Among the bigger fabricators, though, the union may insist on the "Big Steel" contract terms.

Meanwhile, the big steel companies are wrestling with the problem of what to do about offsetting the cost of this year's phase of their three-year agreement. They've already kicked in with a 3¢ an hour cost-of-living wage boost and probably will be nicked for another 4¢ effective with the first pay period in

Small Firms

July. In addition, the 7¢ an hour basic wage rise plus increases in increments between job classes and rises in fringe costs will bring this year's total "take" of the steel workers to over 20¢ an hour, by company estimates. The USW figures it at around 18¢ an hour.

Worry Over Prices—There's no question that the steel companies will increase their prices. But they're concerned—at least some of them—over the probable public reaction to the amount. This concern is likely to work in favor of an increase that, by company estimates, will not be enough to cover the increased cost of labor and subsequent boosts in the mills' materials and services costs.

This could mean that while some steel firms have been beating the drums for an increase of as much as $10 a ton, the actual increase could be much less than that. At this stage, the $5-$6 per ton prediction looks like a better bet than some of the larger estimates.

Who Causes Inflation?—While the deadline for higher steel wages and probable higher steel prices nears, the USW and some steel companies have been carrying on a running battle over who is responsible for inflation — management or labor.

The disagreement centers on costs and prices. Earlier in the year finance chairman Robert C. Tyson of U. S. Steel Corp. blamed labor for steadily rising prices.

Labor's "Vast Power"—". . . the vast power of industry-wide labor unions in compelling annual increases in employment costs far beyond increases in productivity is automatically compelling inflation," he said.

Other steel spokesmen have taken up the theme. Steel employment costs will go up 20¢ on July 1, they say. Steel prices will have to be increased.

Union Hits Back — Two weeks age USW chief Dave McDonald hit back at the steel companies, singling out U. S. Steel for attention.

Bones of Contention—The companies and the union clash on practically all the facts but there are three big bones of contention. First there is the question of profit margins. Steelworker economist Otis Brubaker told a congressional committee in January that steel profit margins were over the national average and have increased in recent years while the overall figures were declining. He called the industry's return on investment "excessive."

Steel companies says their profit margins are fair and are necessary to attract badly needed capital. They say also that their profit margins are inflated since they list as income funds that should rightfully be set aside for depreciation.

McDonald On Spot

Steel Workers boss Dave McDonald may yet wind up in the Senate rackets committee hot seat.

A group of dissident United Steel Workers members, headed by Donald C. Rarick and his "Dues Protest Committee," has secured a promise from the rackets probers that they will "look further" into complaints of "corruption" and mishandling of funds in the USW.

Rarick and a dozen other USW members complained that McDonald used "millions" of dollars out of the union treasury to beat back Rarick's unsuccessful bid last year to unseat McDonald. They also claim that USW officials have generally misused union funds.

Other charges against the McDonald regime includes the use of union dues money for political activity and that some of Rarick's supporters have had their lives threatened during the campaign.

Will U.S. Back Industry Loans?

Senators Say It Is Cheaper Than Fast-Tax Aid

A new mobilization loan plan is proposed to replace the once-broad tax-am program.

Arguments for it are strong. White House and ODM reception is cool.—By N. R. Regeimbal.

■ Odds are against any widespread use of government loans and loan guarantees to replace the dwindling tax amortization program, despite strong backing from some congressmen.

There's little doubt that the tax amortization program, either by legislation or by executive action, will soon be reduced to only two or three goals. These goals will limit amortization strictly to facilities for direct defense and atomic energy procurement, and research and development.

Moneymaking Proposition—The staff and some members of the Senate Commerce Committee are pressing hard for widespread use of loans and loan guarantees to replace tax amortization as a tool to encourage necessary defense capacity expansion. These sources argue that a loan-type program doesn't cost the government anything, and may even make a few dollars in interest and fees, whereas tax amortization has cost the government $3 billion in interest.

Gordon Gray, new director of the Office of Defense Mobilization, has agreed to study the feasibility of a new mobilization loan program.

The Opposition—But the same forces and arguments that killed a loan program in 1950, will probably work against it again.

Under existing legislation, loans and loan guarantees can only be granted if the Defense Department or the Atomic Energy Commission certifies that a project is "essential" to national defense, and ODM agrees. Once this certificate of essentiality is granted, a firm must still dicker with the Treasury Department for the money and negotiate interest rates and repayments. The Department can refuse to make the loan.

Thus, even if a new program of loans were demanded outright by Congress, they could only be used in a narrow area of production, and would probably not replace the once-broad tax amortization program.

Ike Is Cool—History of mobilization loans shows a continuing reluctance among government officials to use them. Some $1.2 billion in loan authority has been available under the Defense Production Act for loans, loan guarantees and purchase contracts for some time. However, only $851 million has been spent, although this represents a possible total government obligation of about $7.1 billion.

When the Eisenhower Administration took office in 1953, the relative merits of loans and loan guar-

AGREES TO STUDY: Gordon Gray, director of the Office of Defense Mobilization has agreed to look into the feasibility of a mobilization loan program. But Washington circles doubt Gray will support the plan.

antees versus tax amortization to encourage expansion were studied and loans were again killed, reportedly because of the absolute opposition of former Treasury Secretary George Humphrey.

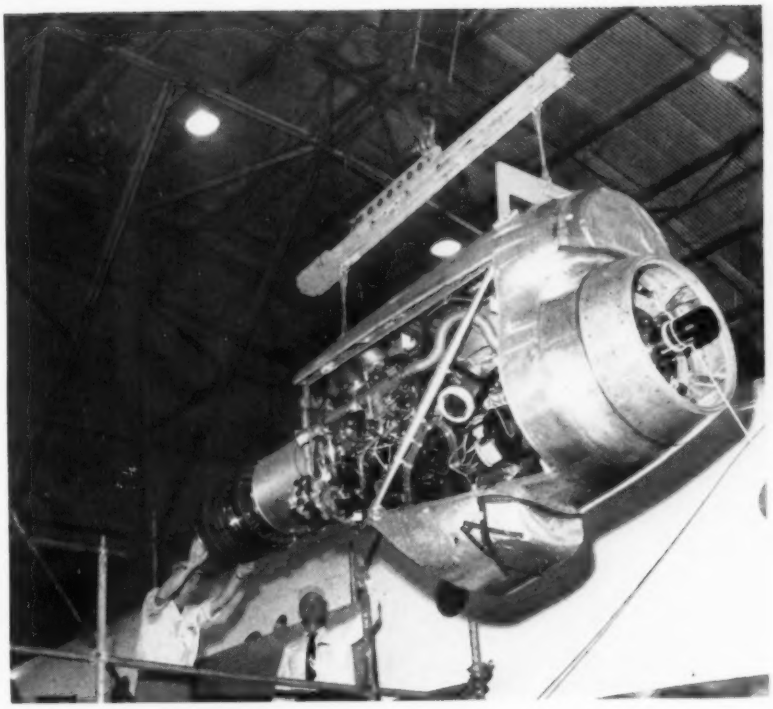
Anderson's Attitude—The ODM staff, according to officials, never got deeply into a study of loans at that time. In the current study, the ODM staff will lean heavily on fiscal experts of the Treasury Department and other government agencies, a spokesman says.

The reaction of Robert B. Anderson, the new Secretary of the Treasury, to the loan proposal is a question mark, but he will probably tend to be generally conservative.

Guarantees Favored—The staff of the Senate committee argues that the government has made a net profit of $20 million on the $13 billion in loans and loan guarantees made since World War II, compared to the $3 billion lost on tax amortization. Thus far, some $35 billion worth of industrial expansion has received tax amortization.

Tax AM Shortcomings—Committee sources use as a peg for their arguments the government's recent decision to grant a nickel expansion contract to Freeport Sulphur Co., rather than Bethlehem Steel Co. They claim that the government, by giving tax amortization and agreeing to buy 271 million lb of nickel at 74 cents from Freeport, will lose at least $10 million when compared to Bethlehem's request for a loan without a guaranteed purchase or tax amortization.

Reaction to the loan arguments by ODM and other government agencies is mixed, but there are indications that they aren't convinced. They point out that direct loans can only be granted when regular commercial loans are not available, and they are the "questionable" risks where the loss to the government may be pretty high. In addition, they argue that interest on the money the government has to borrow to make the loans must be paid "almost to perpetuity" because of the nature of the public debt.



DEPENDS ON GOVERNMENT: If General Services Administration goes along with several pending proposals, industry is set to up output of nickel, critical for making such equipment as this Allison turbo-prop engine.

Nickel Output Hike Tied To U.S. Aid

▪ Government officials are weighing two more industry plans to expand nickel output by providing a guaranteed market in the stockpile for any future excess production.

General Services Administration has received a proposal from the International Nickel Co. that the U. S. government agree to buy part of the output of INCO's new plant in Manitoba for the stockpile. GSA and INCO are negotiating on the proposal, and spokesmen refuse to reveal tonnages involved.

The INCO plant in Canada would eventually produce about 75 million lb of nickel a year from Manitoba deposits. Some government officials are skeptical of the need for a purchase contract, arguing that the plant will be built anyway. They also point out that Congress is threatening to cut stockpile funds and that some Congressmen have recently criticized government purchase contracts for nickel.

Cuban Proposals—GSA is also conducting talks with Bethlehem Steel Co. on a possible proposal to aid development of the firm's nickel deposits in Cuba. Bethlehem has not yet filed a specific plan with GSA, but if filed, it would be an alternate to a proposal rejected last year in which Bethlehem sought a government loan.

Two types of aid are now available for nickel expansion, fast tax amortization and stockpile contracts under the Defense Production Act.

Dairy Farmers Go Stainless

FOR MILK: Farmers are leaning more toward stainless steel milk tanks.

Swing to stainless milk holding tanks provides big, growing market for stainless mills.

Chronic nickel shortage prompts drive to "sell" 200 Series to dairymen.

▪ Stainless steel producers have struck another rich vein in the gilt-edged dairy market.

Dairy farmers all over the country are installing stainless milk holding tanks. Over 50,000 of the tanks have gone in since 1950 and the average tank takes about 600 lb. of stainless steel.

What It Means — In stainless terms, this tonnage represents a tidy cash outlay. In Pittsburgh the 138 farms supplying Harmony Dairy Co. recently made the switch to holding tanks. They paid, for the tanks and related equipment, a total of $450,000. At the same time, the Harmony Co. put $50,000 into new equipment and trucking firms spent $75,000 for stainless tank trucks.

Several aspects of the development are pleasing to stainless men. For one, the dairy industry provides a solid, stable market. Milk consumption increases each year. Per capita use has jumped from 297 lb in 1940 to 356 lb last year. Milk production goes up in good years and bad. It went up 2 billion lb in 1954; is now 126 billion lb.

Down On The Farm—Another cheery aspect: The holding tanks are going to dairy farms as distinct from dairy processing centers. The dairy centers were among the first to adopt stainless on a wide scale. As early as 1933, 79 pct of all milk pasteurizers were stainless. Today it's 100 pct; and the same is true for other major processing devices. National dairy groups have given official blessing to stainless for all surfaces in contact with milk.

This makes for a steady replacement market in an industry with an ironclad growth pattern. At the same time, the full penetration of stainless limits the gains that can come with new applications.

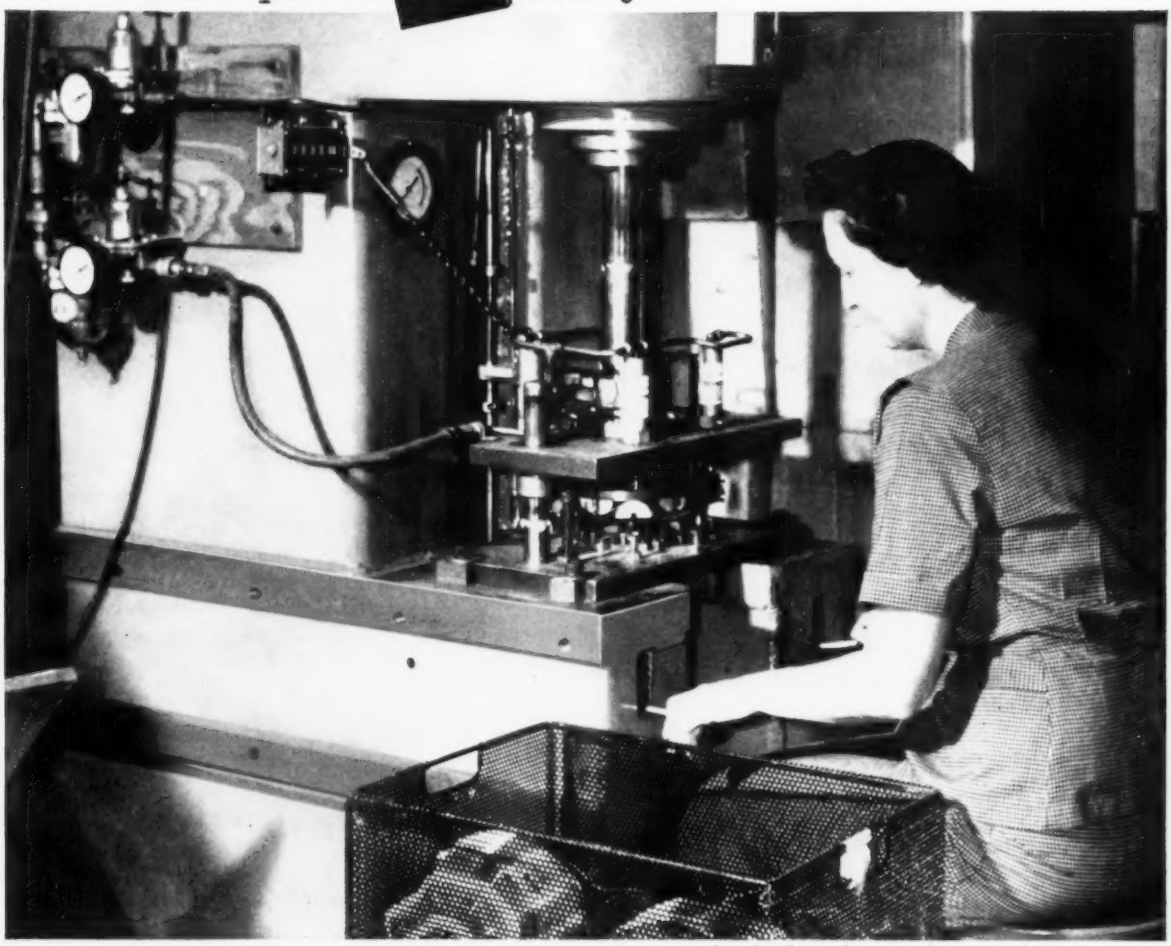
Potential Growth—On the individual dairy farms, however, there is plenty of virgin territory. Dairymen are a relatively prosperous farm group. Their pay comes in regularly each month. They are not subject to violent price fluctuations. They gross between $4 billion and $5 billion a year.

In addition, dairy farming is tending toward fewer and larger units. The Harmony Co., for example, has half the number of suppliers it had two years ago but gets as much milk. All of which points toward increasing mechanization of milk handling on the farm.

How It Began — The stainless holding tanks are one step in this direction. U. S. Steel pioneered this development, working with University of Wisconsin in test programs and pushing application among dairy people. The rapid acceptance of the tanks has helped push stainless shipments to the dairy industry from 3900 tons in 1953 to over 7500 tons last year. Counting warehouse shipments, these figures can be about doubled.

Another farm application which is bound to grow is the use of piping systems between the cows and the holding tanks. The whole trend is toward completely mechanical handling from the cow to the bottle.

A Multipress case study



Forming multi-colored tops for music box carousels is an operation performed 1000 times per hour on this 8-ton hydraulic Multipress.

MULTIPRESS forms 1000 parts hourly for toy maker

DENISON's hydraulic Multipress has greatly increased production . . . cut rejects . . . lowered costs for a Los Angeles toy manufacturer, Mattel, Inc.

In one operation, an 8-ton Multipress is used to form the top for a music box carousel. The lithographed and pierced metal blank is placed on an 8-piece die set which has two sets of conical shaped form blocks. Only one ram stroke is required to form the multi-colored tops at the rate of 1000 per hour.

Datalog MUL-2 describes in detail Mattel's use of Multipress. For your copy, write Denison Engineering Division, American Brake Shoe Co., 1242 Dublin Road, Columbus 16, Ohio.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

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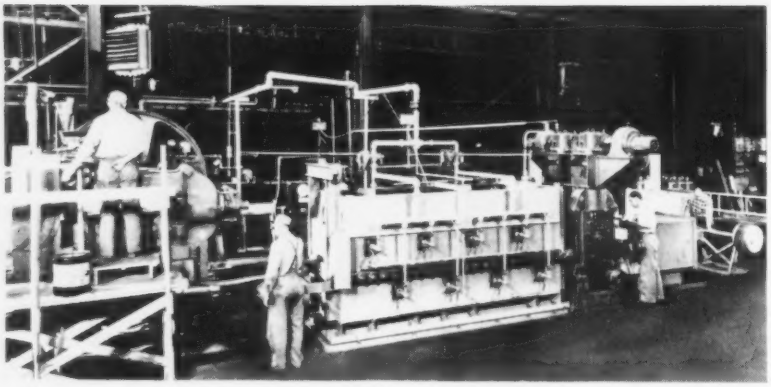

POWDER: New sintering line makes high quality strip directly from powder, saving 80 pct over conventional rolling. It is a pilot line of E. W. Bliss Co., which has exclusive license to make the units under a Chemetals Corp. process which recovers powder from lean ores or scrap.

Major Expansion In Alabama Steel Mill

Republic Steel's Gadsden, Ala., plant now boasts 408,000 additional tons of ingot capacity from new electric furnaces, new 54 in. strip mill, tandem cold mill to turn out 48-in. wide product, new galvanizing line, and new allied cutting and slitting lines.

The major factor in the expansion is viewed as the new continuous sheet mill. It will be only the second source in the area for hot and cold rolled, and galvanized, and the only integrated one for 48 in. sheet. The other is U. S. Steel's Tennessee Coal and Iron Div., Birmingham.

Sell in South — Market researchers for Republic expect to sell most of the output in the South and Southwest. Actually, it is expected the company will get all the business it can handle from Alabama, Kentucky, Tennessee, Texas, Oklahoma, Louisiana, and Arkansas.

Freight Comparisons — Compared to T. C. and I., Republic's Gadsden plant will have freight advantages in most of Northern Alabama, a slight advantage to the East and North, and a relatively slight disadvantage into Florida, Houston, Arkansas and Louisiana.

In product potential; market for galvanized in farm construction and air conditioning is good. Little cold-rolled sheet is sold in the area. But a new source of supply may lure new industry.

Output Up—The new furnaces at Gadsden will bump ingot capacity by 50 pct. to 1.19 million tons. Backed by this, the new strip mill will up output of galvanized sheet and roofing from 4000 tons to 10,000 tons per month.

Production goals also call for 13,000 tons per month of cold-rolled sheet, and 7000 tons of hot-rolled sheets in coils of cut lengths.

Offer For Northeastern

Carpenter Steel Co., Reading, Pa., has offered 40,000 to 65,000 shares of its common stock for a new issue of Northeastern Steel common stock.

Carpenter stock would be distributed to creditors and debenture holders of Northeastern at the rate of 30 to 40 pct of the claim. For this purpose Carpenter stock has been evaluated at $70 per share.

Based on Capital—The difference in the amount of stock offered is based on extent to which Northeastern working capital is reduced by the time the court confirms the plan. Minimum is 40,000 shares

Northeastern trustees J. William Hope and Richard J. Smith reported in favor of the plan because "it insures the continuation of Northeastern Steel Co. in Bridgeport, Conn."

They also pointed out that while payments to creditors would not equal total debt, Carpenter stock "has well recognized possibilities of appreciation."

Cold Finishing Mill

Jones & Laughlin Steel Corp., Pittsburgh, has put a new cold finished bar mill into operation at Willimantic, Conn.

Hot rolled bars will come from Pittsburgh for cold drawing and processing into cold-finished products. The operation is one of the first on this side of the Atlantic to use Schumag continuous cold drawing machines. Coils of hot rolled steel are drawn, straightened, polished and cut in one operation.

Merger Litigation

Justice Dept. attorneys last week filed their briefs in Federal District Court for a summary judgement against the proposed Bethlehem Steel—Youngstown Sheet & Tube merger. Judge Edward Weinfeld set Sept. 20 for the steel company lawyers to file their briefs in reply, and Nov. 4 as the date for a court hearing on the motion.

No ruling on the motion for summary judgement is expected until December at the earliest, and probably not until sometime in 1957.

If the government's motion is denied, the regular trial, which has been interrupted by the government's action, will be resumed.

Long and High Voltage

John A. Roebling's Sons Corp., Trenton, N. J., subsidiary of Colorado Fuel & Iron Corp., is nearing completion of $2.5 million project covering installation of new facilities for making high voltage power cable, and other wire products.

LAMSON NUTS . . .

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DEPENDABILITY of LAMSON BOLTS

The perfect teammate for a Lamson Bolt is a Lamson Nut.

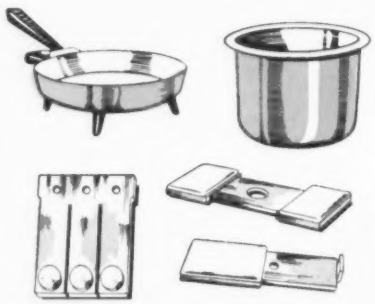
Because they come from the same family, and are manufactured to the same quality standards, Lamson Nuts and Bolts make the perfect holding combination. A COMPLETE range of sizes and types are in stock ready for immediate delivery.

For assured quality and fit that meets production line standards, always specify Lamson Nuts.

NEW BRIDGEPORT METAL LAMINATES

Offer Design and Production Opportunities No Single Metal Provides

Inside and outside story of metal laminates, their range of applications and properties.

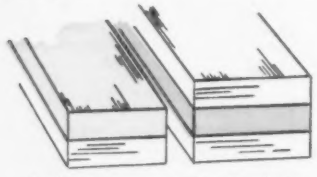


Typical applications include copper/stainless electric frying pans, heat exchanger tube sheets, salt pots, electric terminal strips and contact parts.

BRIDGEPORT METAL LAMINATES open up entirely new concepts in product design and application. Made up of layers of two or three dissimilar metals, metallurgically bonded, they can provide a combination of chemical, physical and mechanical properties that would be impossible to obtain with a single metal.

A Metallurgical "Sandwich"

Layers of metals are combined in either Duplex or Triplex form and are held together permanently by means of a specially developed braze-type bond. This bond has exceptional shear strength. There is no peeling, cracking or chipping, even in thin laminations. Furthermore, because it is a true metallurgical bond that joins the component materials, better use can be made of the individual physical properties of each metal.



Duplex Laminates **Triplex Laminates**
Metallurgical bonding makes a laminate a "one-piece" metal with multi-metal characteristics.

Many Uses

A variety of metals can be formed into Bridgeport laminates. Thus it is possible to develop an almost unlimited variety of properties with different metal combinations. Some of the jobs, for instance, that can be performed are in:

1. Solving dual corrosion problems
2. Improving electrical and thermal conductivity
3. Combining high thermal conductivity with corrosion resistance
4. Obtaining greater strength-to-weight ratios in combination with other specific properties, such as conductivity or corrosion resistance.

Typical metals that can be combined are copper, brass, stainless steel, Muntz Metal, monel, mild steel, iron and the precious metals. Other combinations are possible.

Advantages

In addition to offering a wide range of desirable characteristics, Bridgeport Laminates offer unusual design and production economies. They are easily formed and joined. They can be furnished in desired shapes and formed to size, thus replacing forgings which would involve high machining costs.

In many instances, too, a thin sheet of relatively expensive material laminated with a thick sheet of less costly metal is more economical than a thick sheet of the more expensive material.

Properties Can Be Varied

Laminate properties are "tailor-made" and depend on the combination of metals used. However, some of the general characteristics can be stated.

Copper/Stainless Steel Laminates Offer Many Desirable Characteristics

Copper/stainless steel laminates have excellent heat transfer properties, high structural strength, are nonmagnetic and have no appreciable thermostatic action to cause warpage or distortion. Likewise, their corrosion resistance is high, especially in applications where dual corrosion problems exist.

Heat exchanger tube sheet, 2 in. ASTM A-201 Gr. A firebox plate, 3/8 in. naval brass.

The strength of an individual laminate combination approximates the average strength of each of the bonded metals, depending on the amount of each metal in the laminate.

Thermal conductivity is based on the same conditions.

Ductility depends on the metals used. The laminates are usually furnished in the annealed condition, ready for forming. Surface finishes are not permanently affected by laminating.

Types, Sizes

In Duplex Laminates, either component can vary in thickness from .010 to 2 inches. They are made in sizes up to 30 inches square and, in many cases, even larger.

Triplex Laminates vary in component thickness from approximately .015 to 2 inches.

Samples

Test samples of Bridgeport Metal Laminates for development work are available through all Bridgeport Sales Offices. Specifically, copper/stainless Duplex Laminates and stainless/copper/stainless Triplex Laminates are immediately on hand and special combinations can readily be furnished.

Engineering Assistance

The design and manufacturing possibilities for Bridgeport Laminates are extremely flexible and offer virtually unlimited advantages. Bridgeport's long experience in the laminate field can be of decided benefit to you. We will be glad to furnish you with detailed technical assistance on any specific problem. Call your nearest Bridgeport office for full details.

Free Laminates Brochure
Bridgeport Metal Laminates, their properties, applications, types, sizes, are described in an 8-page technical publication. Write for your copy today.

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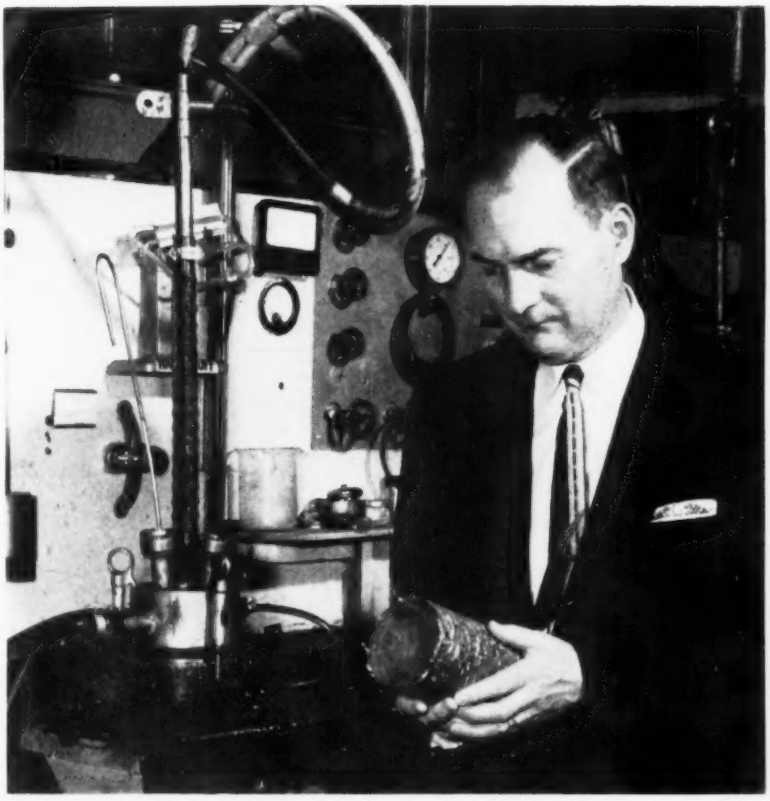
Robert A. Lubker

Success in Guiding Researchers

At only 36, Bob Lubker heads up one of the country's largest metallurgical research teams.

Directing a department with a staff of over 150 at Armour Research Foundation is a big assignment.

But results prove he's found the right formula for getting the job done.



Robert A. Lubker: Always give research staffers credit for their ideas.

▪ Keeping over 150 metallurgical researchers working together in high gear calls for a man able to blend technical astuteness with knowledge of how to get the best from his staff.

Robert A. Lubker, who at 36 directs one of the largest metallurgical research departments in the U. S., apparently knows the right formula.

The results achieved by his staff in the metals research department at the Armour Research Foundation of the Illinois Institute of Technology at Chicago offer convincing evidence of his administrative ability.

Impressive Results—Accomplishments in the four years he's been the Foundation's metals research manager include: Development of an important titanium alloy, 6AL-4V. Pioneering in fiber metallurgy to turn out a continuous fiber sheet soon to go on the market. Playing an important part in solving the corrosion problems connected with putting carbonated beverages in tin cans. Producing self-fluxing brazing alloys now in commercial use. And coming up with an improved brake lining material valuable for faster landing jets.

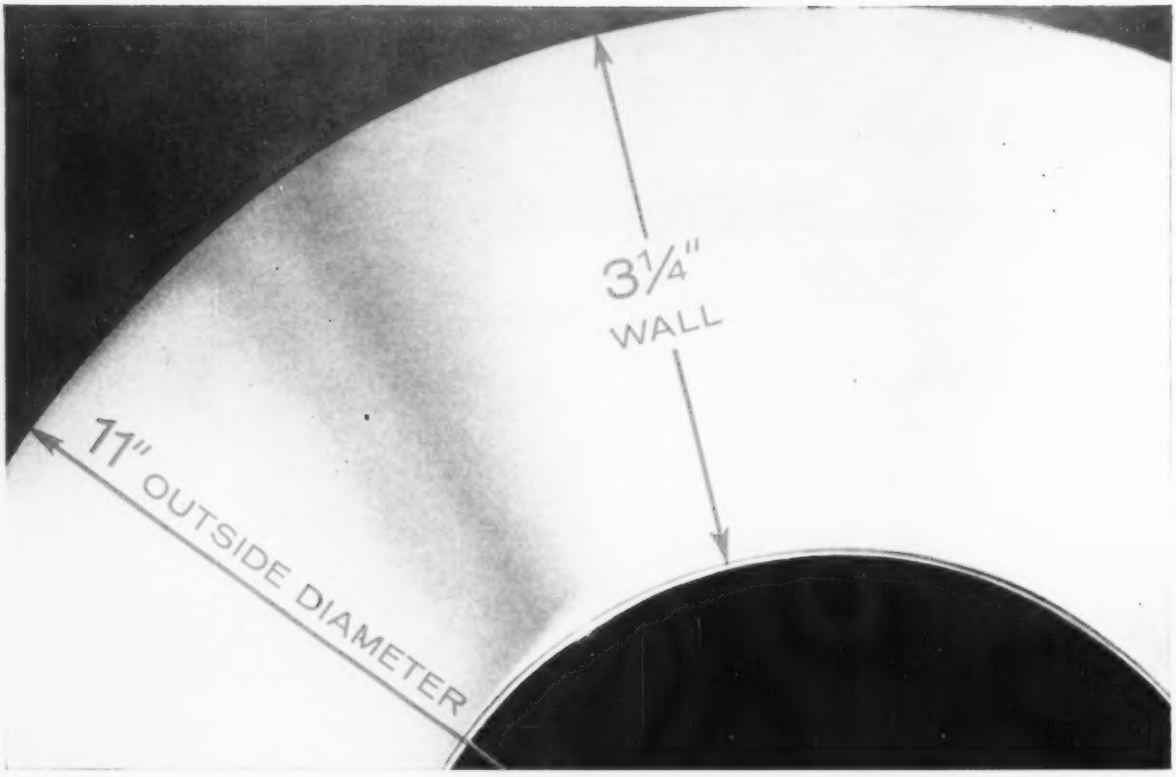
Reasons Why — Behind these achievements is a research staff with an unusual sense of teamwork. And associates feel three rules Bob Lubker uses in handling his staff are the reasons for that strong team spirit.

First, he believes in effectively delegating authority. If it's done properly at the top, he feels, results in efficiency and high morale will extend to all levels.

Second, he makes a special effort to see that individuals get full credit for their ideas and work. "This goes a long way toward fostering the creativity so vitally needed in metallurgy," Lubker emphasizes.

And lastly, he concentrates attention on getting and keeping staff personnel well acquainted with each other. Following the theory that good friends work together better than relative strangers he stresses departmental sports and social activities.

Breaking the Bottleneck—Firmly believing that metallurgical research holds the key to many of tomorrow's industrial achievements Lubker maintains, "Scientific progress in many fields has developed to the point where metallurgy has become a bottleneck for future advancement. Metallurgists are rising to this challenge by solving the limitations now delaying improvements in airplane design and other vital areas."



For increasing steam pressures and temperatures...

Now you can get TIMKEN® seamless steel tubing up to 11 inches O.D. with walls up to 3¼ inches thick

WITH the increasing pressures and temperatures needed for higher capacity and efficiency in electric generating plants, more and more engineers are turning to seamless, heavy wall stainless steel tubing. The Timken Company offers a wide range of sizes and grades of pierced heavy wall stainless steel tubing with a maximum of 11″ O.D. and 3¼″ wall.

Timken® heavy wall seamless steel tubing is available in all the popular AISI alloy and austenitic stainless grades—304, 316, 321, 347 and other special analyses—affording the designer a broad range for corrosion and oxidation resistance.

Timken tubing is made by the seamless piercing process which imparts a refined and uniform grain structure. Weldability is therefore superior. And because the steel is made in our own electric furnaces, you're assured of accurate analysis—uniform from heat to heat, order to order, tube to tube.

For tubing that lets you use the full potential of steam plants you design or build, specify Timken seamless stainless steel tubing. Timken Company metallurgists will be glad to discuss your tubing problems with you. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN STEEL

Fine Alloy

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

What Can You Do About Prices?

You will have to walk a tight wire on prices in the months ahead.

Higher costs are inevitable, but consumer resistance may develop. Question is: How much?

■ Prices may be your big problem in the second half of this year. There's no doubt of where they are going (up, of course), but you will have to do a lot of thinking about effects.

The big question is how will the consumer react. He won't like higher prices. In the past, many makers of consumers goods have been able to absorb some of the higher costs of materials and parts.

They have reduced margins, but increased volume. They have been able to get more hustle from their distributors and retail outlets.

What's the Percentage? Cutting margins at the factory and retail levels has helped many a producer keep his price to the consumer at a relatively steady level in spite of higher costs of materials and labor. But the end may be in sight.

Many now believe they have cut as far as they can. Some, seeing sales down from a year ago in spite of severest attempts to keep prices down, wonder where the future lies in cutting prices and discounting.

Last week one of the major appliance makers advanced prices significantly on one line of products even in advance of the expected steel price hike. Of course, the company had had other increases in costs in addition to the anticipated hike in steel. Its own labor costs, for example.

It's a Risk—In the face of a less than satisfactory market, farm equipment makers will also advance their prices. This means that even in the most competitive markets, manufacturers will have to go along with higher prices and take their chances on their share of the market holding up.

This may not be as disastrous or dangerous as it sounds. The question of when a manufacturer will price himself out of the market isn't easily answered. There's a lot of evidence, for example, that almost as many refrigerators would be purchased in a given year if the prices were slightly lower, that not many more would be at somewhat lower prices.

In many circles, price cutting is the most direct course to oblivion.

. . . Pressure from Wages

Interpret Price Factors—In making your plans and market evaluations, costs and prices will become increasingly important in your thinking. You can't take many of the traditional market indicators at face value without considering the effect higher prices are having on them.

Gross national product continues its climb, consumers' income stays on the upgrade. These, and many other indicators, have to be discounted to the extent that prices have increased in the same period.

Purchasing Power Hit—The Labor Dept. has taken meticulous pains to point out that labor's purchasing power is actually down compared with a year ago. This should be emphasized as important to both labor and management. On the one hand, it indicates less ability to pay for consumers' goods. On the other, it shows that negotiated wage increases do not always guarantee increased purchasing power.

The debate of whether wage increases trigger inflation will go on indefinitely. But this year mandatory wage increases come at a time when many markets are having a tough time holding their own. It will be a severe test.

Utilities Make Big Plans

The Big Spender—If some of the recent developments have you a little concerned, you should get some assurance from the plans of the public utilities.

In your own branch of the metalworking industry, you are probably proud of the money that is being spent on new plants and equipment. But have you looked at the utilities?

Biggest Gain—Utilities are spending at the rate of $6.42 billion for the year. This branch of industry will show an increase of about 27 pct in capital spending over 1956, biggest increase of all industry.

A point to remember is that utilities spend in advance of the rest of industry, to meet the requirements for power that will be needed in the years immediately following.

In comparison with the utilities' $1,788,000,000 projected for the third quarter, iron and steel will spend $411 million, nonferrous $268 million, motor vehicles $326 million, to name a few of those generally considered to be the big spenders in the economy.

Will GM Miss The Boat in '58?

Probably Not—But The Battle Will Be Rough

Ford and Chrysler will fight hard to hold their '57 gains. But GM could reverse the trend.

Ford's Edsel will be an added start in the battle for middle-price sales.—By H. R. Neal.

▪ Will General Motors be able to regain the sales and prestige lost to Chrysler and Ford this year?

Old-timers on the Detroit auto beat are inclined to give the nod to GM. And the odds are with them. They can point to the financial resources of GM; its depth in research and styling; its ability to turn around fast despite its bigness.

The Coming Battle — The old-timers point out, too, that GM may be caught napping once in its appraisal of what the public wants in a new automobile. But twice? Not on your life!

Still, GM for the first time in a long while will be fighting an uphill battle against two knowledgeable competitors who like the feel of having the market swing a bit more in their direction. The tug-of-war over the 1958 auto sales dollar will be one of the sharpest in years.

GM's Big Guns—GM's big artillery in the 1958 model year will be an all-new Chevrolet and Pontiac, plus extensive facelifts for Oldsmobile and Buick. Chevrolet and Pontiac, a year behind in making a major body change, will finally join the swing to a low silhouette. Originally, Olds and Buick were tagged for relatively minor changes, but the year's sales picture changed some minds in those two GM divisions.

An expensive crash retooling program is GM's hope of bolstering sagging sales of its medium-price lines. Re-evaluation of styling was also carried over to the other lines.

The Counterattack—But countering this is the apparent Ford strategy of concentrating its punch where GM has been hit hardest—the middle-price range. It's counting on the new Edsel to give it added strength in this area when the fall surge gets underway.

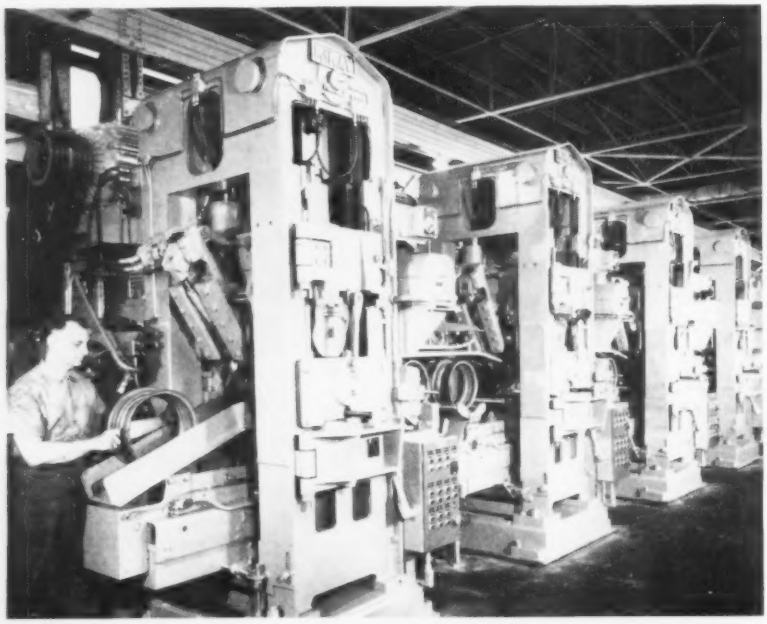
For the first time Ford will be able to compete with GM and Chrysler in the complete middle-price range, upper and lower. Two models, the Ranger and Pacer, will be built on a Ford chassis. Corsair and Citation models will be on a Mercury chassis.

Ford's Secret Weapon — The Edsel embodies some original thinking in the way of styling. Its grille will be vertical, while all others follow a horizontal line. In the face of buyer enthusiasm for flaring fins, the Edsel will sport a sculpted rear fender. Air suspension is also in the works.

And Ford isn't stopping with the Edsel. Lincoln reportedly will introduce unitized body construction (body and frame built as a single unit) to the Big Three. In seeking to escape being mistaken for a 1957 Plymouth, a criticism that has arisen with current models, the car

---

RIM ROLLING: McKay Machine Co., Youngstown, has developed an automatic, high speed rim rolling line. Its rate of production is from 750 to 900 auto wheel rims per hour, 20 pct faster than conventional units. It can be used with four stands (below) or three with a flaring press replacing the first stand. Existing rolls can be used.



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It's been shaking its six ton bulk seven hours a day for better than five years. Imagine the strength of the standard nuts and bolts (made to ASTM specification A325) that have held its heavy metal parts together under such continual vibration.

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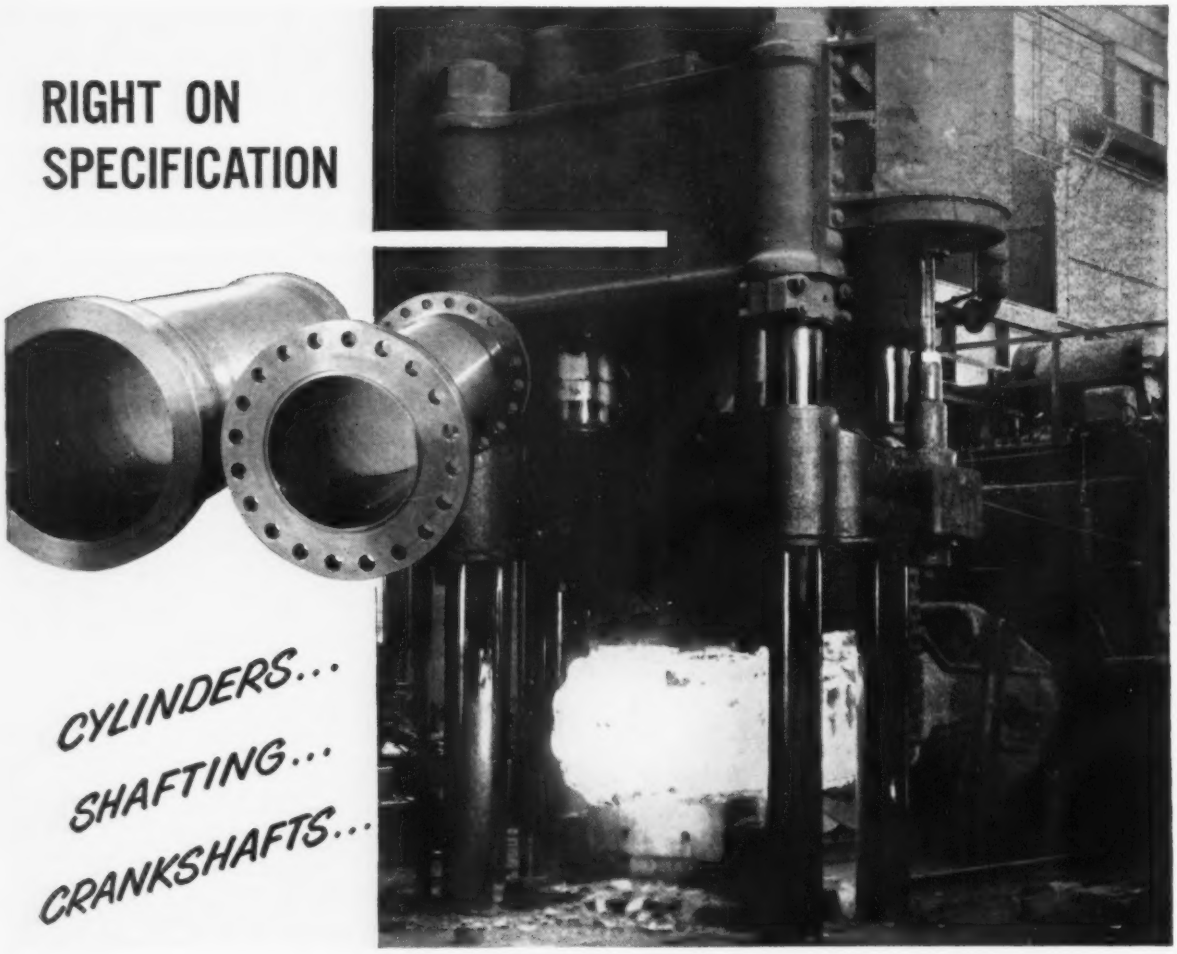

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Offices in Principal Cities

Automotive Production

WEEK ENDING	CARS	TRUCKS
June 15, 1957	126,249	23,192
June 8, 1957	129,517	23,370
June 16, 1956	100,689	20,687
June 9, 1956	104,984	21,480
TO DATE 1957	3,128,373	528,772
TO DATE 1956	2,967,902	551,075

*Estimated. Source: *Ward's Reports*

is said to resemble the Continental Mark II. The new Chevrolet will be met head-on by a Ford with restyled hood and rear deck panels and slimmer fins.

Chrysler's Strategy — Chrysler, enjoying the highest market penetration it has had since 1953, likes the feeling that comes from having customers clamor for its cars. Having made the most radical styling changes of all auto makers for 1957, plus the extensive engineering changes that accompanied introduction of its cars, it will make fewer changes than either Ford or GM. It isn't likely that any major sheet metal changes will be made in any of the 1958 models.

Chrysler feels that the buying public has accepted the company's styling and any changes should be of the more traditional facelift variety. New grilles, taillights and trim will distinguish the 1958 models from current cars.

Independents Fight To Live — Chrysler hasn't however, stopped there, according to reports. An all-new engine, with many new features, has been developed for the De Soto and may find its way into limited use in other lines.

Not to be outdone by all of the plans of the Big Three are the independents. American Motors and Studebaker-Packard feel they must have a larger part of the market for survival.

Stress Economy — Two of the most persistant criticisms heard today about U. S. cars are cost and economy. Each of the independents, in its own way, is out to give the critics what they want.

Studebaker has already made its bid with its Scotsman series. Studebaker believes that Americans want a full-size family car that is low in cost and economical to operate. Critics of costly trim should find this 29 miles-per-gallon car to their liking.

The "Small" Car — American Motors is adding emphasis to its campaign for a switch to smaller cars. Nash and Hudson will appear in 1958 in a Rambler body. This may be a prelude to eventual disappearance of those names from the auto scene within a few years. In any event, American Motors will evidently divorce itself from production of "big" cars. Here again the emphasis will be on economy.

Low Cost Blanks Beat Tooling Deadline

Filling The Gap—When tooling delivery dates are lagging and blanking dies are needed to start production, what do you do?

A. O. Smith Corp., Milwaukee, found the answer by adopting a low cost blanking method to turn out temporary tools, the company's W. R. Wilson told an SAE meeting.

By using the blanking method developed by Templet Industries, Brooklyn, N. Y. (and described in the IRON AGE, April 19, 1956), A. O. Smith has built more than 200 dies of various types and sizes. They have blanked steel up to $\frac{1}{4}$ in. thick. Runs of up to 250,000 pieces have been obtained from a single die.

What It Takes—Tooling costs, exclusive of the licensing fee paid on the patented method, have averaged about 10 pct that of the cost of permanent tools.

Equipment requirements are simple. They include a jig saw, steel rule, hand shear, bending machine, metal cutting saw and surface grinder. Only a moderate amount of skill is required to turn out the dies. Most of the blanking tools can be built in a few days, some in a few hours.

Where Useful — While many of the tools have produced parts far beyond the temporary requirements, A. O. Smith has not abandoned its plan for permanent blanking tools. However, the new tools make their need much less urgent.

THE BULL OF THE WOODS — By J. R. Williams

LISTEN, SON, YOU KEEP YOUR EYE ON THAT BIG PLANER OVER THERE -- WATCH EVERY-THING HE DOES, AND WHEN THEY NEED A MAN, YOU'LL BE IN LINE FOR TH' BIG JOB!
IT MUST BE GREAT TO HAVE A SON-- IF YOU TOOK THE WRONG ROUTE IN LIFE, YOU CAN TRY A NEW ANGLE THRU YOUR BOY!
YEH, BUT YOU'D MAKE A MESS OF THAT, TOO-- BECAUSE TH' WAY THINGS CHANGE, TH' WRONG WAY YOU TOOK WOULD BE TH' RIGHT WAY FOR THEM TO TAKE!
THE SECOND START
J.R.WILLIAMS

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"The final polish is far superior to anything we have been able to produce in the past," writes Mr. Jensen. "This gives a sparkle and fish-catching ability to our lures which is responsible for our continued increase in sales." And he adds: "The use of Chase Dry-Rolled Brass cuts our polishing costs approximately in half because the fishing lures can be polished in half the time, thus doubling our production with the same costs."

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Hard Money's New Champion

Anderson Will Continue Humphrey Policy

New Treasury Secretary directs Administration's united front against cheap money.

Democrats, sensing political "blunder," mount attack on costly credit.—By G. H. Baker.

■ The hard money policy, despite mounting criticism, seems sure to continue in favor for a while. Robert B. Anderson, the incoming Secretary of the Treasury, is another apostle of high interest rates and generally tighter credit rules.

Mr. Anderson, a successful Texas businessman, is Ike's choice to succeed George M. Humphrey as Secretary of the Treasury in the near future. (Mr. Humphrey goes to National Steel Corp. as chairman of the board.)

Retreat Postponed — The Eisenhower Administration's united front against cheap money therefore will continue intact. It's no accident, of course. Mr. Anderson was selected out of many candidates for the Humphrey job chiefly because his views on money matters closely parallel those of the President and Mr. Humphrey.

Hard money has never been particularly popular among congressmen of either party. And the grumbling over the rising cost of interest has been mounting in recent months. Eventually, Congress believes, the Administration will have to modify its money policies, but there's no let-up in sight.

No Easy Borrowing—The Federal Reserve Board takes the position that inflation is a clear and present danger, and that this is no time to let money get any cheaper by easing up on the credit rules.

COMING AND GOING: George M. Humphrey (left) has been succeeded as Secretary of Treasury by Robert B. Anderson, former Defense Deputy.

Outlook: There's no sign that lending rates will ease for a long time—barring, of course, an unforeseen depression. Anderson's appointment means that the Humphrey money policies are to stay in effect indefinitely.

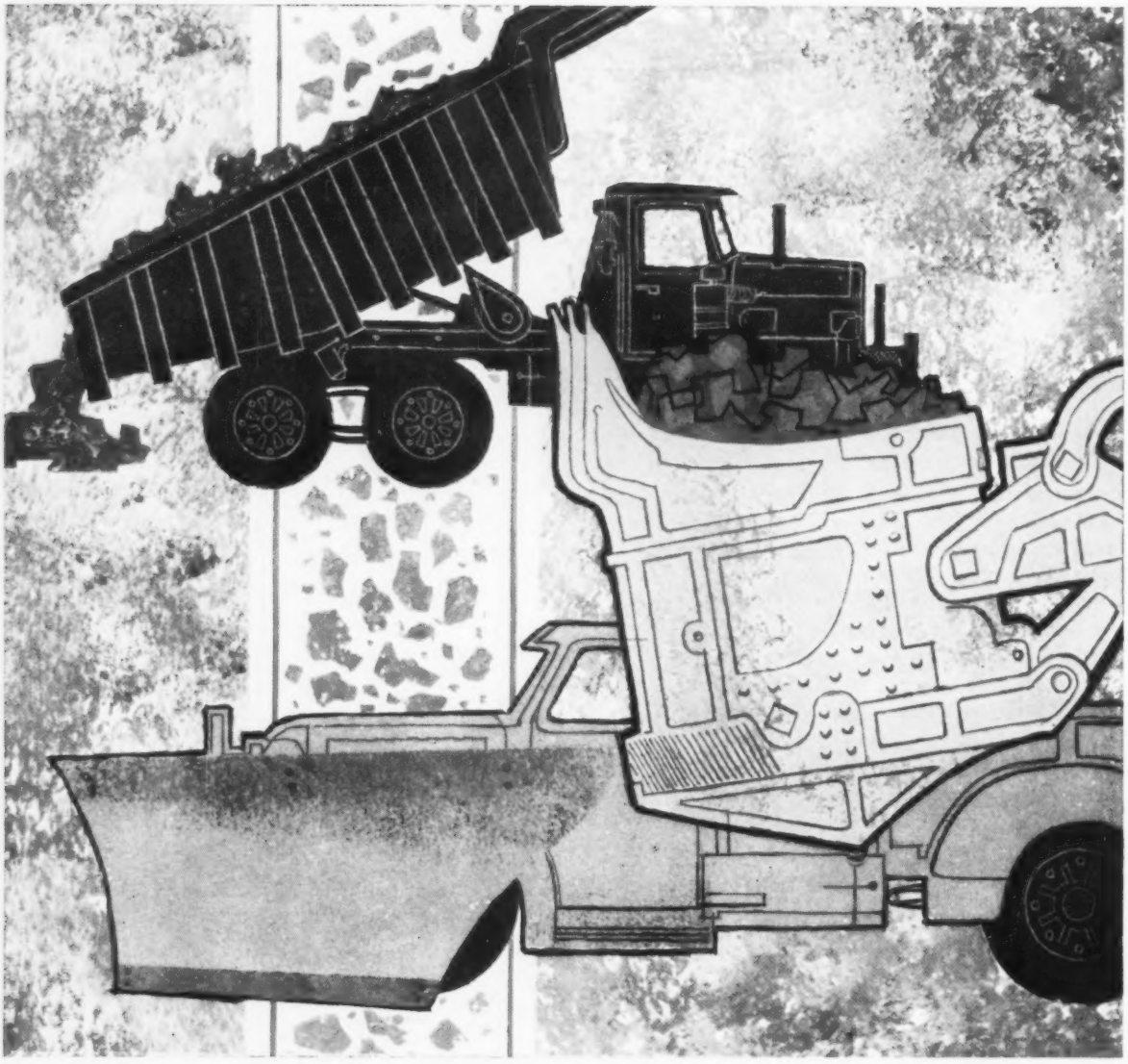
Humphrey's Farewell: Defending Policy

George M. Humphrey, the outgoing Secretary of the Treasury, is undergoing one more political "roughing up" before he leaves.

Democrats on the Senate Finance Committee plan to ambush Mr. Humphrey if they can. Their purpose: To make some political hay out of his hardmoney policies.

Political Blunder?—Most Democrats are convinced that the Eisenhower Administration's drive for costly credit has been a major political blunder. Everybody who borrows money, whether it's for a new car or a new steel mill, wants cheap interest rates, they argue.

Campaign Ammunition — Specifically, the Democrats claim Mr. Humphrey's hardmoney policies have: Caused a depression in the homebuilding industry; forced the automobile industry to curtail its production and lay off thousands of workers because of lagging sales. (Only 5.8 million cars will be sold this year, GM admits); slowed down buying of consumer goods, thus crimping the retail trade.



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Power Lack May Slow Northwest

More Hydro-Electric Projects Needed

Fast paced industrial activity has put a strain on Washington State's power supply.

Future industrial growth of the area may hinge on fast development of more local, low-cost sources.—By R. R. Kay.

■ Failure to develop more power capacity based on hydro-electric facilities could short-circuit industrial growth in the Pacific Northwest. The long-range outlook has improved a bit. But the short-range prospect is not so good.

Industrial activity is rolling along at a merry pace. Washington State is enjoying its seventh straight "biggest year yet." And 1957 looks as if it will top 1956.

Good business conditions of the past two years strained the area's power supplies. They increased dependence on steam generation and imports.

Power Cost Versus Transport—However, the region's future growth depends on more hydroelectric projects. If they come fast more heavy-power using industries will locate there. But power must be cheap to offset costs of shipping raw materials in and finished products out. The advantage of the Pacific Northwest for such industries is getting slimmer every day.

The cost of hydro power must be compared with steam generation in areas closer to raw materials and major markets. Steam generation costs are going down, while hydro-electric costs keep rising.

Slower Pace Predicted—Some 35 pct of the nation's primary aluminum is made in the Pacific Northwest. Since 1940 over 50 pct of the phenomenal increase in power use was in the electroprocess industries. They're the most important new group added to the region's industrial base.

However, in the coming ten years the total load growth will be at a slower rate. And less than two-fifths of it will go to the electroprocess industries.

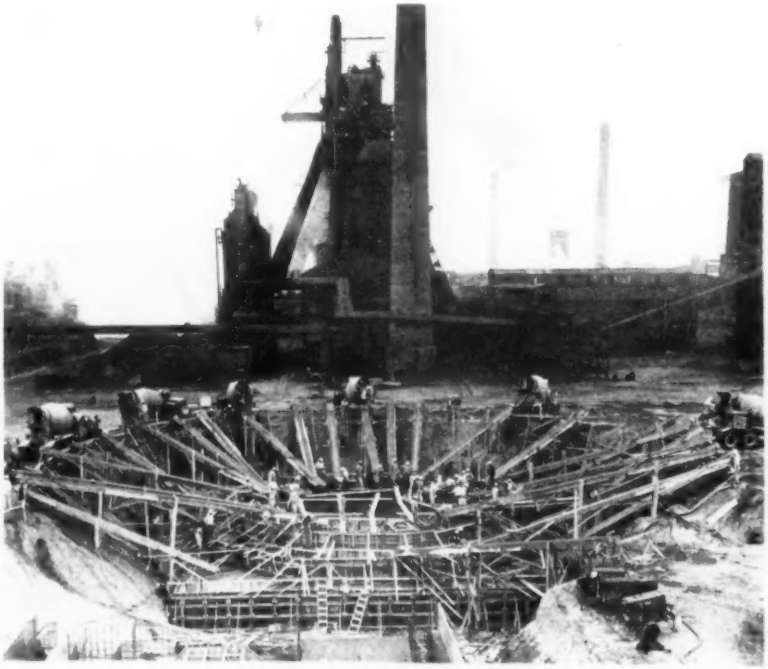
Gleaming Future

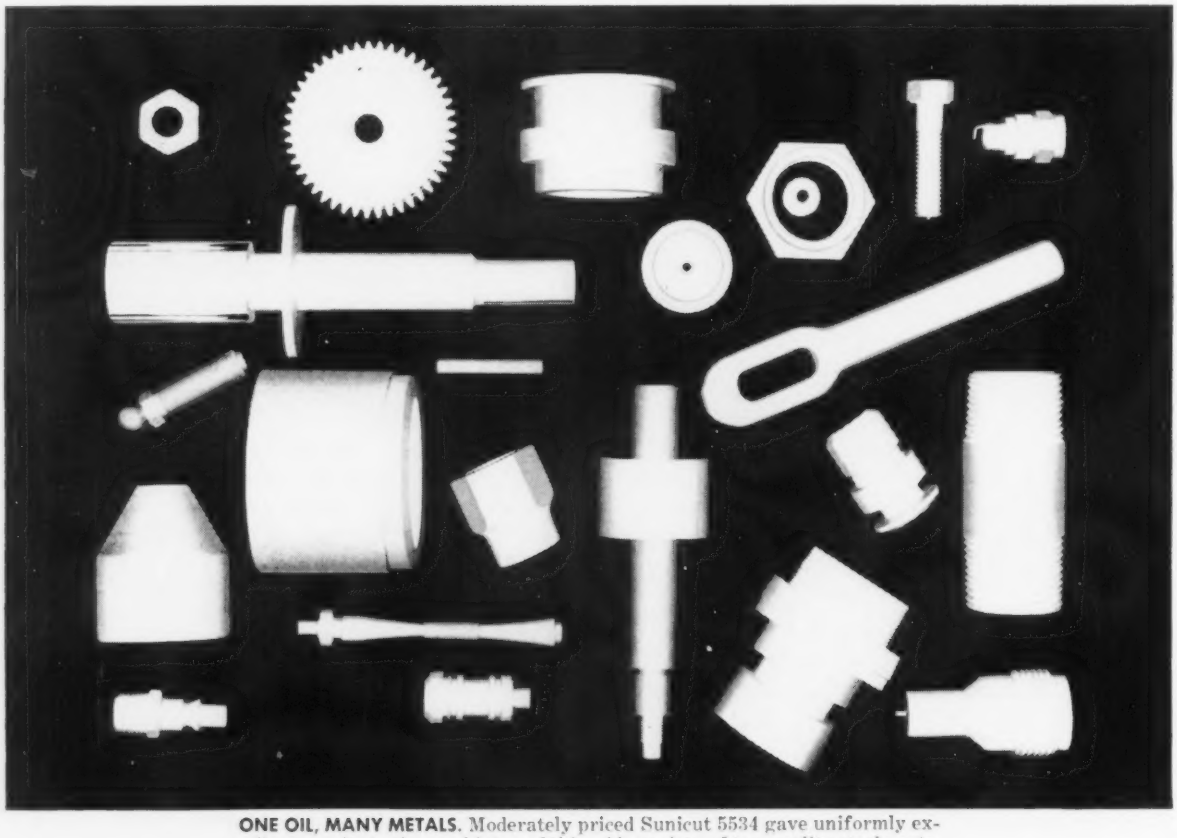
Kaiser Aluminum & Chemical Corp.'s S. S. Inch, vice president-sales, predicts a 100 pct increase in the aluminum market by 1965. Aluminum use should rise from last year's 4.1 billion pounds to 8.4 billion pounds, says Mr. Inch. And the electrical industry's use of aluminum should go up some 140 pct in the same period.

Look Out Chicago

Southern California's importance as a manufacturing employment center keeps steadily rising. And at a pace still well ahead of the national average. By 1965, manufacturing employment in the Los Angeles-Long Beach area could push Chicago from second place. That is, if present trends continue.

STAKING A CLAIM: Pouring of concrete foundations for Kaiser Steel Corp.'s fourth blast furnace at the Fontana steel mill proves out word from Edgar F. Kaiser, firm's vice president, that "the west needs more steel production and (our) current $194 million expansion program is aimed at retaining a reasonable share of this growing market."





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Military Differs on Tool Lease

Wants Price Cut For Use of Its Equipment

ODM is pushing for uniform method of leasing gov't. machine tools to industry.

Key part of program is cash rental. But military favors discount on price of items made with U. S. tools. —By E. J. Egan, Jr.

▪ Early adoption of a uniform method for leasing the government's machine tools to industry hinges on what the military does.

Just now the Defense Dept. finds one element of the proposed program hard to take. The obstacle is cash rental (THE IRON AGE, May 23, p. 115). It doesn't jibe with general Pentagon practice.

Loaned, Not Rented—Currently, the military owns all but about 30,000 of the government's 323,000 machine tools. Many of the military's tools are used by defense contractors on an "end product price offset" basis. In lieu of rent money, the armed services get a price cut on the items produced.

Defense Dept. says this system is equitable and workable. But the Office of Defense Mobilization isn't convinced. In the ODM's view, large producers are using tools rent free. But smaller concerns may be paying one percent or more per month of the original cost.

ODM Wants Cash Rental—Moreover, ODM hopes to get its uniform leasing policy adopted as a package, and cash rental is a primary part.

The entire concept of uniform leasing practices was discussed at great length by federal agencies before Defense Mobilizer Gordon Gray. Several recommendations made are acceptable to all agencies involved, except the Defense Dept.

Despite the hassle, no permanent holdup of the standard leasing code is expected.

Budget Intact—Congress' budget axe missed the Metalworking Equipment Div. of the Commerce Dept.'s Business & Defense Services Administration. The Division's staff of 13 people, and two non-salaried executives on loan from the machine tool industry, will remain intact for the next fiscal year.

This is considered another sign that Washington appreciates the role machine tools play in industrial and defense plans.

The small staff performs many liaison functions for both the government and the machine tool industry.

Orders Off—Total new orders for machine tools this year probably "will fall considerably short of the total for 1956" ($924 million, net). So says Cleveland headquarters of the National Machine Tool Builders' Assn. However, "It seems probable that the industry will ship at least $850 million in 1957."

NO MARGIN FOR ERROR: An optical jig borer machines more than 800 holes in this 11-ft-long die holder. Workpiece is part of the tooling for new adjustable shelving to be made by Standard Pressed Steel Co.

INDUSTRIAL BRIEFS

Another Landslide—P. C. DeBruyne has been elected president of Malleable Founders' Society, Cleveland. Mr. DeBruyne is vice president of Moline Malleable Iron Co., St. Charles, Ill.

Cash and Credit—The Gray Iron Founders' Society, Cleveland, is offering a design contest to designers, engineers or others responsible for a design or redesign of a product to use gray or ductile irons. In addition to cash awards the two top winners will receive citations. Contest closes on August 20, 1957.

Magnetic Field—Bussey Research Laboratories, Inc., Rockford, Ill., has expanded facilities for serving manufacturers in the electrical, electronic, magnetic and related fields. The new facilities are available for special projects or complete research and development work. Bussey's equipment is valued at over a quarter of a million dollars and would take at least a year to duplicate.

A Constitutional Construction—State of Maine voters in September will get an opportunity to pass on proposed constitutional amendment to let the State insure up to 90 pct of mortgages on new industrial buildings. Hope is approval will attract new industries, promote expansion, and bring in money not now available for venture purposes.

Long Haul — A total of 326 loaded rail cars and 65 highway trucks were required to haul glass grinding and polishing equipment from Hamilton Division of Baldwin-Lima-Hamilton Corp., Hamilton, O., to new Ford Motor Co. glass plant at Nashville, Tenn. Shipment required an entire year.

Head Count with Brains—Bureau of Census is purchasing two Remington Rand Univac computers in preparation for the 1960 census. When delivered in 1958, the new computers will be employed in the Bureau's current work to relieve two older overworked "brains."

Increase in Capital — Capitol Metals Co. and All American Steel & Metals Co., Los Angeles, distributors of sheet steel have merged. Capitol Metals becomes one of the largest warehouse distributors of flat-rolled steel products west of the Mississippi. Consolidation has resulted in the addition of structural steel and plate to the company's inventory. The firm will break ground soon for a $250,000 plant in Vernon, Calif.

Double the Ante — Research facilities have been doubled at the Petrolia, Pa., refinery of L. Sonneborn Sons, Inc., New York. Called the Breth Laboratory, the new facilities will extend the company's efforts in four major product fields: white mineral oils, petrolatums, microcrystalline waxes and petroleum sulfonates.

Brick-Laying For Brick Building—Electro Refractories and Abrasives Corp., Buffalo, has started construction on a 200 by 40 ft addition to its facilities at Blasdell, N. Y. The addition will be used for output of custom industrial refractories.

Researching for Nothing — The Denison Research Foundation, a not-for-profit Ohio corporation, has been established at Columbus by William C. Denison, president, Denison Engineering Co. Initial emphasis will be on projects in the electronic, mechanical, metallurgical, ceramic and management fields, serving both industry and the U. S. Government. Its full time staff will be augmented by a supervising board of consultants made up of prominent scientists.

Rigid Steel Expansion—Sawhill Tubular Products, Inc., Sharon, Pa., has started construction on a new plant to manufacture rigid steel electrical conduit. A long-term contract has been completed with The Steelduct Co., Youngstown, O., to sell output of this plant in both the domestic and export markets.

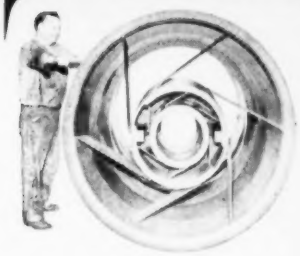
No Leaky Faucets — Conoflow Corp., Philadelphia, has been awarded the contract for all main control valves for the Olin Revere Metals Corp. alumina plant at Burnside, La. The $50 million plant is a joint venture of Olin Mathieson and Revere Metals Corp. The plant is designed to turn out 350,000 tons of alumina annually

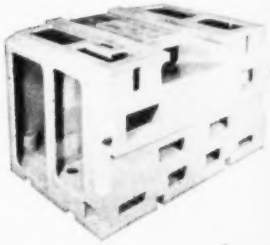
Full Slate — P. B. Craighead, president of Magnesium Products of Milwaukee, magnesium fabricators, has been elected president of The Magnesium Assn. O. E. Grant, vice president of Magnode Products, Products, Inc., Trenton, O., and John Thomson, general manager, Dominion Magnesium, Ltd., Toronto, Ont., have been elected vice presidents.

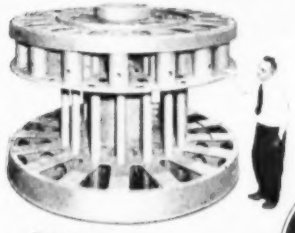
More Research—A new research and development pilot plant building is being constructed at the Electrode Div. of Great Lakes Carbon Corp. plant, Niagara Falls, N. Y. Features include modern instrumentation on all equipment for achieving exacting control, an area for small-scale development and testing work, a completely equipped machine shop and microscopic laboratory.

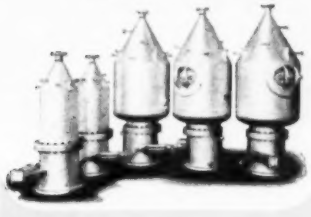
Fifty Freshmen — Fifty scholarship awards of $650 each for the 1957-1958 academic year have been made by the trustees of General Electric Educational & Charitable Fund to GE employees, their children, and qualified children of pensioned or deceased employees. Unrestricted grants of $350 for each winner will go to the regionally accredited college or university attended by the award recipient.

Terrific Impact — The impact extrusion process is now being used by Harvey Aluminum, Torrance, Calif., to produce structural components in various sizes for military and commercial applications. Typical of the parts being impact extruded are piston tube orifice supports for hydraulic landing gear cylinders. The aluminum supports are designed with integral flanges to accommodate mounting sections.

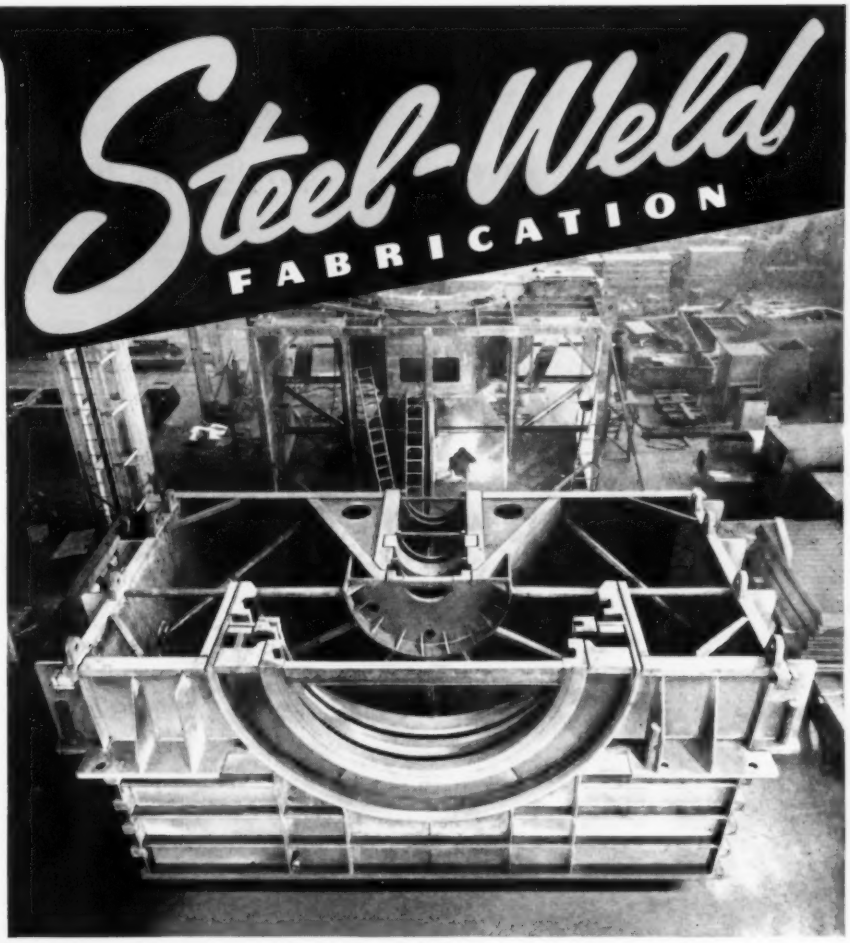








Steel-Weld FABRICATION



The weldment shown above is one half of the base for a 300,000 KW Steam Turbine...it weighs over 100 tons. This base, and the units shown at left, are typical of the thousands of Steel-Weld Fabricated parts and assemblies produced by Mahon each year for manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment. Are you taking full advantage of the economies offered by welded steel components in your products? In the design of almost any type of heavy machinery, or mechanical engineering project, there are parts and subassemblies that can be produced more economically and more satisfactorily in welded steel . . . because, in weldments you get greater strength with less weight, plus the additional advantages of greater rigidity and 100% predictability. When you consider weldments, you will want to discuss your requirements with Mahon engineers, because, in the Mahon organization you will find a unique source for weldments or welded steel in any form . . . a fully responsible source with complete facilities for design engineering, fabricating, machining and assembling . . . a source where design skill is backed-up by craftsmanship which assures you a finer appearing product embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or have a Mahon sales engineer call at your convenience.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago

Engineers and Fabricators of Steel in Any Form for Any Purpose

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LOOKS CAN DECEIVE...
PERFORMANCE WILL TELL YOU

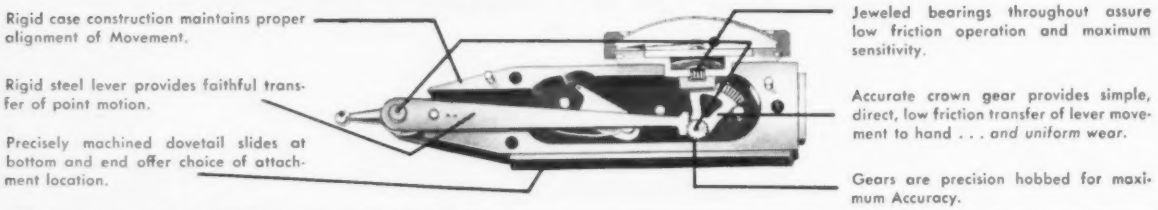
Many have tried . . . yet none match the built-in accuracy of the

FEDERAL TESTMASTER

TRADEMARK REG. U.S. PAT. OFF.

WHY the Testmaster is so Amazingly accurate

Its Movement is designed and built by the world's foremost gage specialists


Rigid case construction maintains proper alignment of Movement.
Rigid steel lever provides faithful transfer of point motion.
Precisely machined dovetail slides at bottom and end offer choice of attachment location.
Jeweled bearings throughout assure low friction operation and maximum sensitivity.
Accurate crown gear provides simple, direct, low friction transfer of lever movement to hand . . . and uniform wear.
Gears are precision hobbed for maximum Accuracy.

HARD CHROMED, PRECISION INDEX POINTS

Tungsten tipped points are also available for extra durability.

Index Point locks in place but is easily removed for replacement. 180° swivel of Point permits wide choice of instrument positioning.

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Don't pay for a lot of confusing dials. Dials graduated .001" or .0001". (Metric, .0025 mm or .010 mm). Adjustable for zero setting in any position.

Many universal test indicators are "look-alikes". **Each year it seems somebody else decides to copy the Federal Testmaster. But however closely its *appearance* is imitated, you can always tell the Testmaster by its accuracy.**

No other gage has a Movement like the Testmaster. Actuated by a lever and crown gear, and with jeweled bearings throughout, the Testmaster has exceptional sensitivity and *long, repetitive* accuracy throughout its range. Its time-proven Movement is not to be confused with "spiral groove" gages whose accuracy is uncertain or with other Movements where friction, looseness of fits, end shake in pivots, and uneven contact pressure contribute to unreliable performance. The Testmaster is designed by the world's largest gage manufacurer and is ruggedly constructed to give lasting service in the shop or toolroom where the variety of its applications is almost limitless. For information and prices, write . . .

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Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging

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Galvanized

ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283" to .035"... Roegal (drawn galvanized) from .187" to .005".

And Roebling galvanized wire can be packaged in the way most convenient and economical for you... in coil diameters of 60", 30", 22", 16" and 8"...on reels, spools or handy spoolless cores.

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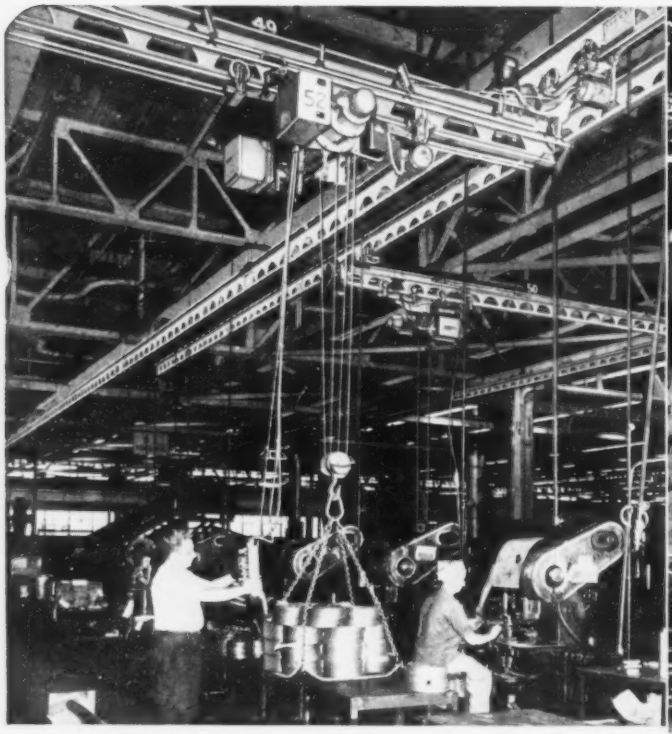
CRANES *SPEED* PALLET-HANDLING

Store More—Eliminate Congestion—Cut Maintenance—Save Floors



Pallets loaded with motor stator laminations are easily lifted and moved with these floor-operated Tramrail cranes. Note that the entire area is jam-packed with no lost aisle way space. The ease with which any loaded pallet can be picked up and handled to awkward to reach places is a distinct advantage.

Pallets with 32 100 lb. kegs of nails are piled high in storage with the cab-operated Tramrail crane and open side pallet lift.

THERE'S no height limit when stacking palleted materials with Tramrail cranes. 20 ft.—30 ft.—40 ft. or higher are easy. Your materials and building are the only limiting factors.

Often 50% and more materials on pallets can be stored in a room served by overhead cranes. Narrowing of some aisles, elimination of others, plus higher and closer piling make the difference.

Pallet loads are moved safely and speedily overhead where the path is always clear and unobstructed. Placing this handling job near the ceiling, reduces floor congestion and frees much of it for other purposes.

Maintenance costs for Tramrail cranes are extremely low, usually only a few percent of that for power-operated floor trucks. No engines to overhaul. No clutches to replace. No brakes to re-line. No batteries to charge. No irritating gas fumes. And of importance, extra heavily reinforced floors are not required and costly floor damage because of materials handling is eliminated.

When considering pallet handling or any materials handling, it will pay you to look into the tremendous advantages that Cleveland Tramrail cranes offer.

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THE CLEVELAND CRANE & ENGINEERING CO.
1875 EAST 200TH ST., WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT

R. H. Morse, Jr., elected president and chief executive officer, Fairbanks, Morse & Co.

R. N. Kendall, appointed vice president, Colonial Broach & Machine Co., Detroit.

Leonard Shelley, elected vice president, Federal Pacific Electric Co., San Francisco.

M. D. Shriver, named vice president and asst. to the president, Panellit, Inc., Skokie, Ill.

T. W. Krueger, promoted to sales manager, Jack & Colling Hoist Divisions, Duff-Norton Co., Pittsburgh.

W. J. McKee, appointed asst. vice president, sales, National Tube Div., U. S. Steel Corp.

K. D Malick and **L. H. Spargo,** appointed manager, petroleum and chemical sales, and general industrial sales, respectively, Houston district office, Allis-Chalmers Industries Group.

E. N. Cooley, appointed vice president, Thermal Products and Petroleum Industry Equipment Divisions, Alco Products, Inc.

H. F. Cole, named manager, sales, U. S. Steel Supply Div., Newark, N. J.

R. W. Fish, appointed eastern Michigan district sales manager, Delta Power Tool Div., Rockwell Mfg. Co., Pittsburgh.

R. D. Northcutt, appointed manager, Trenton plant, American Bridge Div., U. S. Steel Corp.

J. C. Ewer, appointed asst. sales manager, abrasives, Norton Co., Worcester, Mass.

R. E. Williams, appointed general manager, sales, National Tube Div., U. S. Steel Corp.

Donald Leighton, appointed asst. to the vice president and general manager, Owosso Div., The Midland Steel Products Co., Cleveland.

C. P. Hammond, appointed asst. to the vice president, operations, A. M. Byers Co., Pittsburgh.

G. L. Martin, named asst. director, Chemistry Dept., National Research Corp.

C. W. Polonus, appointed manager, Milwaukee district sales office, Sharon Steel Corp., Sharon, Pa.

Dr. W. H. Jukkola, appointed supervisor, chemical services section, Jones & Laughlin Steel Corp.

L. L. Brightman, appointed vice president and general manager, Mexico Refractories Co., Texas.

R. J. Dineen, appointed manager, general industrial sales, Cincinnati district office, Allis-Chalmers Industries Group.

James Rainey, appointed district sales manager, south central United States, Yale Materials Handling Div., The Yale & Towne Mfg. Co., Chicago.

M. B. Dickey, appointed manager, midwest district, Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.; **E. F. Patterson,** named manager, northeast dis-

trict; **W. C. Portman,** named manager, east central district; **R. W. Self** will manage the midwest district.

New sales representatives for Allis-Chalmers Industries Group are: **H. O. Foster,** Buffalo; **B. C. Griwatz** and **J. V. Rumble,** Pittsburgh.

C. W. Moore, appointed representative, S. W. Card Div., Union Twist Drill Co.

J. E. Higgs, will become resident manager, Huntsville, Ala., electric furnace plant, Norton Co.; **A. K. Walton,** named asst. resident manager.

precision
stands
alone . . .

"Fischer Turned"
ALUMINUM NUTS

Fischer precision-turned aluminum nuts set new standards of uniformity and accuracy that speed assembly operations . . . reduce costs.

Standard types and sizes or "specials", you pay no premium for this extra quality . . . Fischer turned aluminum nuts cost no more than those produced by other, less exact methods.

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C-308-FS

Fischer SPECIAL MFG. CO.

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Nils Lindstrom, appointed superintendent, Tool Div., Moore Special Tool Co., Inc., Bridgeport, Conn.

W. S. Sanderson, appointed manager, education and training, The Industrial Div., Gould-National Batteries, Inc., Trenton, N. J.

D. E. Schwendemann, appointed manager, organization and business management and **C. B. Clum,** appointed regional manager, Detroit Diesel Engine Div., General Motors Corp.

F. B. Sykes, appointed sales manager, Commercial Crane Carrier Div., Four Wheel Drive Auto Co., Clintonville, Wis.

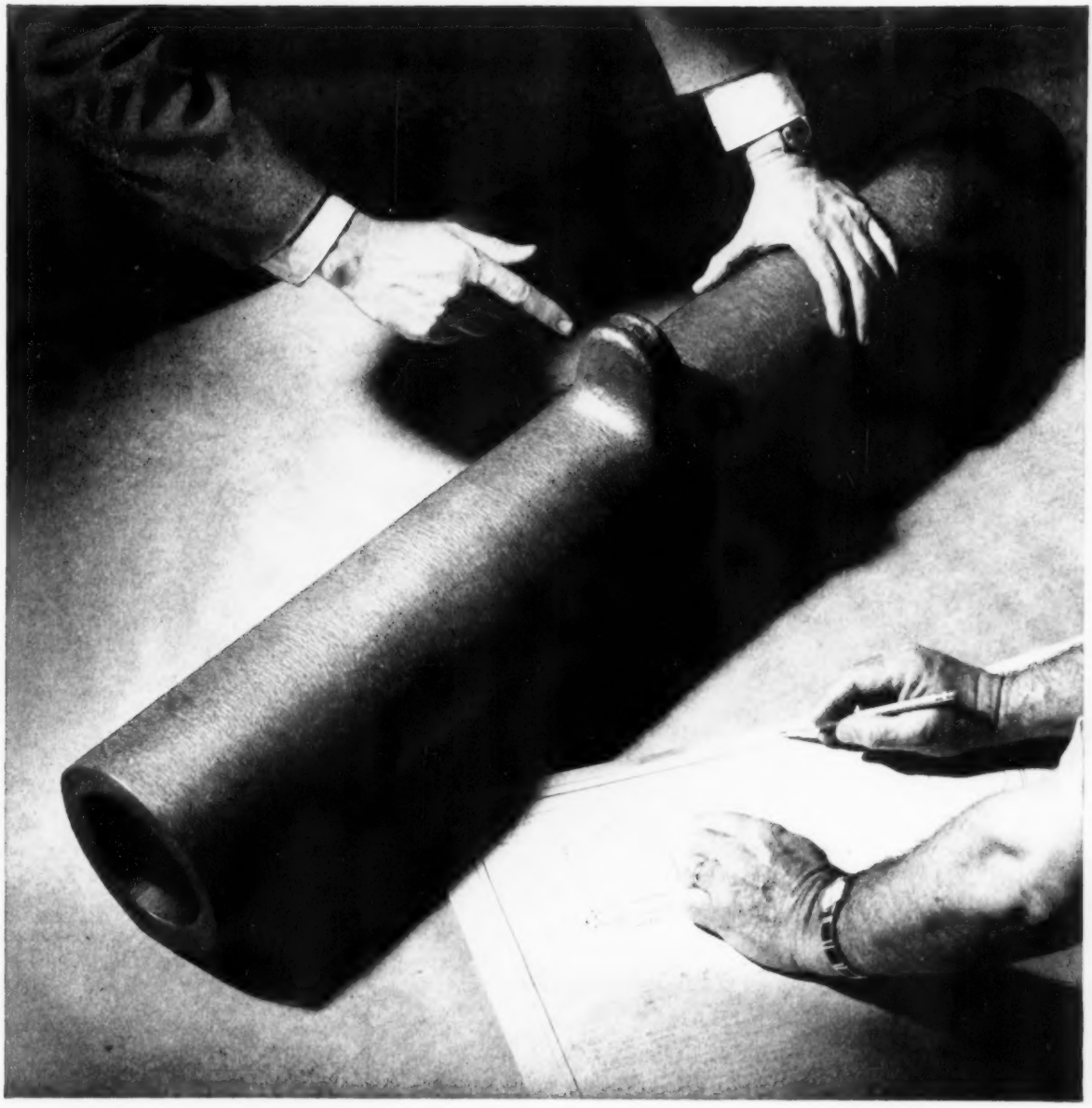
E. A. Johnson, elected vice president, marketing, Marketing Dept., Barry Controls Inc., Watertown, Mass.

L. R. Sullivan, Jr., appointed sales representative, Boston office, Spang-Chalfant Div., The National Supply Co.; **P. R. Brooks,** transferred to the New York district office as sales representative.

J. R. Diehr, named purchasing agent, Herbrand Div., Bingham-Herbrand Corp., Fremont, O.

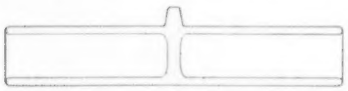
W. J. Geib, named district export sales representative, Austin-Western, Construction Equipment Div., Baldwin-Lima-Hamilton Corp.

L. H. Bosnian, appointed senior vice president, Chain Belt Co., Milwaukee; **W. J. Sparling,** appointed vice president, manufacturing and facilities; **E. M. Rhodes,** appointed general manager, industrial equip-



THE CAMERON CURE FOR DESIGN DILEMMA

How would you produce this relatively simple component? Actually, it's not simple but Cameron had the cure. This actuator for the horizontal stabilizer of the North American F-100 Super Sabre is a cylinder with a thin solid center section and one central protrusion. For-



merly it was a weldment – two sections of tube stock with a small forging in the center – right here is where the headache developed because a cold bending operation was required. Welds parted, rejects were too high. The Cameron split-die forging process changed all of this.

Now it is forged in one piece. Grain structure is excellent, final machining and cold bending are easy—rejects are low and design department spirits are up.

If you have a problem in a ferrous component (200 to 5000 lbs.), especially one for critical service, with internal curvatures and perhaps odd protrusions which cannot be forged in conventional dies, CALL ON CAMERON.

Our facilities are complete from melting of high quality alloy steels for our unique forging operations to final machining if desired. Many knotty design problems are finding a simple solution in the unusual shapes and quality controlled alloys coming from Cameron. Write or call . . .

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SPECIAL PRODUCTS DEPARTMENT
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What is your swaging I.Q.?

Are you aware of the new techniques and equipment that are making rotary swaging increasingly important as a basic precision production process? Test your knowledge of modern rotary swaging with this TRUE or FALSE quiz.

SWAGING is economical—no chips, no scrap . . .

SWAGING produces work accurate within ± .001" . . .

SWAGING improves physical characteristics . . .

SWAGING can produce inside contours . . .

SWAGING can be automatic or semi-automatic and does not require skilled labor for operation . . .

FENN is one of the largest manufacturers of a complete size range of swaging equipment . . .

FENN swaging equipment swages tubing up to 6¼" diameter and solid bar stock from pinpoint to 3¾" diameter . . .

If you answered TRUE to all the questions, your knowledge is excellent. If not, you should have more information on modern rotary swaging.

In either case, it will pay you to get a copy of the new Fenn Swaging Catalog No. SM56. Write today!

FENN ROTARY *Swaging Machines*

THE FENN MANUFACTURING COMPANY 303 FENN ROAD, NEWINGTON, CONN.

ment section; **Harold Patzer,** appointed sales manager, foundries.

E. C. Westphal, named asst. sales manager, Rolled Steel Corp., Skokie, Ill.

J. G. Kearns, appointed production manager, Lord Chemical Corp., York, Pa.

A. A. Monnett, Jr., appointed director, Distribution & Availability Div., Commercial Dept., U. S. Steel Corp.

Ralph Fields, named director, sales promotion and merchandising, consumer markets, Reynolds Metals Co., Louisville, Ky.

B. E. Horst, appointed sales manager, Machine Tool Div., Barber-Colman Co., Rockford, Ill.

J. B. Stazinski, named manager, manufacturing, Elmira foundries, General Electric Co., **M. J. O'Brien** will become manager, manufacturing and **E. R. Filosi,** named man-

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LUSTERIZED* LEDLOY*
sets the pace for production of top quality machine parts

You can maintain the maximum output of your automatics by utilizing the high machining rates that are available to you with Bliss & Laughlin's

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These modern steels show wide gains over ordinary screw stocks . . . 45% to 60% faster than B-1113 . . . and as much as 100% over C-1117 or similar grades.

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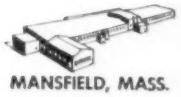

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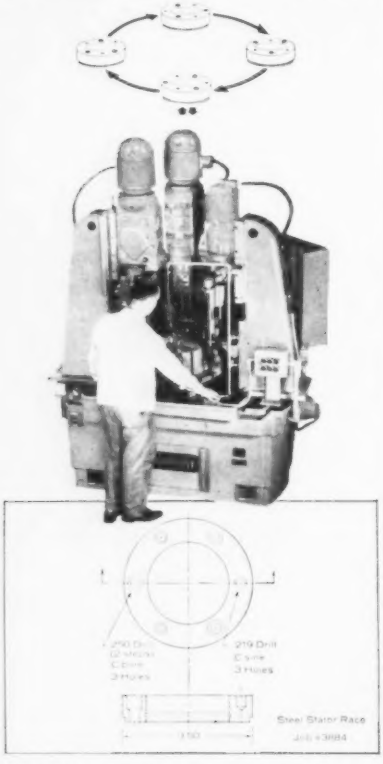


This Kingsbury indexing automatic performs these three operations on 290 steel stator races per hour (gross). Three vertical operating units have multi-spindle auxiliary heads. All tools have guide bushings to maintain accuracy. An air cylinder actuates the clamp.

Simple (like this) or complex, a Kingsbury is the best indexing automatic you can buy:

it will be fully tooled, ready to produce

it will meet your specifications for accuracy and production rate

it will pay for itself in a matter of months

We have designed, built and tooled thousands of automatic drilling and tapping machines. It is our only business. May we come see you? Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

ager, manufacturing engineering, Everett-Lynn foundries; **N. Harold Boardman,** named manufacturing consultant, Elmira operation.

M. A. Grogel, appointed product supervisor, rigid foil containers, Reynolds Metals Co., Louisville, Ky.

J. E. Mitchell, appointed manager, factory sales and service branch, Clark Equipment Co., New York.

R. L. Bobo, appointed general sales manager, Federal Pacific Electric Co., Newark, N. J.

R. E. Brandon, named turbine steam path design engineer, Large Steam Turbine - Generator Dept., General Electric Co.

R. F. Marlin, appointed purchasing agent, Parts Div., Sylvania Electric Products, Inc., Warren, Pa.

R. S. Evers, named junior design engineer, Research Dept., Maytag Co., Newton, Iowa.

S. L. Lida, appointed manager, Applied Science Dept., Time Equipment Div., International Business Machines Corp., New York.

A. J. Cochrane, named asst. to vice president, Youngstown Sheet & Tube Co.

Hubert James, Jr., named regional western sales manager, San Francisco, covering 11 states, Anderson Electric Corp., Birmingham, Ala.

Harold Hoekelman, appointed manager, Chicago district, Youngstown Sheet & Tube Co.

W. A. Johnson, appointed sales manager, Grinder Div., Royal Oak Tool & Machine Co., Royal Oak, Mich.

M. D. Ratcliff, appointed district sales manager, David White Instrument Co., Milwaukee.

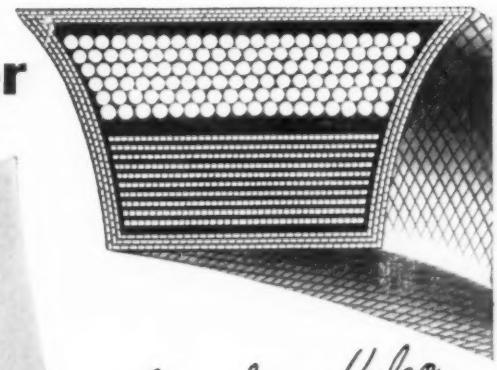
R. F. Reid, named sales manager, Arter Grinding Machine Co., Worcester, Mass.

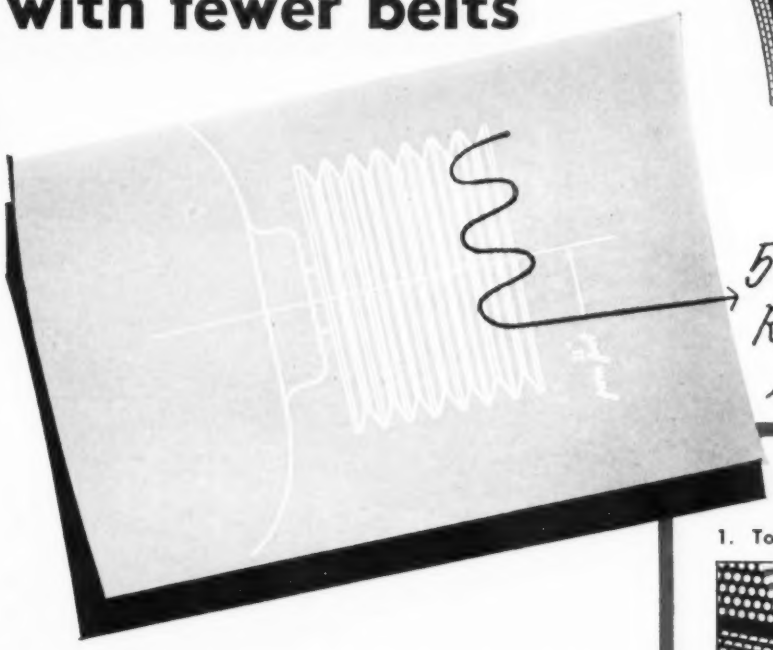
R. W. Selvig, appointed sales representative, New York and New Jersey territory, Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.

J. J. Wycall, appointed manager, St. Louis sales branch, Crucible Steel Co. of America; **K. C. Kelly,** promoted to Southern regional sales manager; **R. D. Leslie,** named asst. manager.

Cut sheave width and weight...

get same horsepower with fewer belts





5 Gates Super Vulco Ropes do the work of 7 standard V-belts

Where space is limited and weight a factor, design your drive with this important fact in mind:

5 Gates Super Vulco Ropes do the work of 7 standard V-belts

That's because a Gates Super Vulco Rope has 40% more horsepower capacity — delivers more horsepower per dollar invested than any standard V-belt drive. Sheaves with fewer grooves cost less . . . weigh less . . . take less room. Drive design is invariably improved.

A wealth of drive data is quickly available to you. Simply call your nearby Gates distributor for a Gates V-belt specialist. Stocks carried in industrial centers around the world.

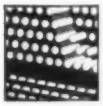
The Gates Rubber Company
Denver, Colorado

GATES Distributors are in the Yellow Pages

The Mark of Gates *Specialized* Research

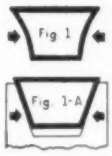
No other V-Belt has ALL these advantages

1. Tough, resilient Tensile Cords



Super strong resilient tensile cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required . . . save weight and space.

2. Concave Sidewalls (U.S. Pat. 1813698)



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

3. Flex-Weave Cover (U.S. Pat. 2519590)

A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

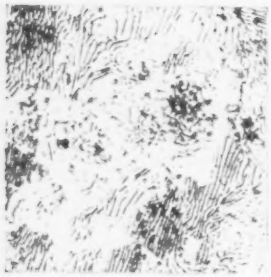
5. Oil, Heat, Weather Resistant

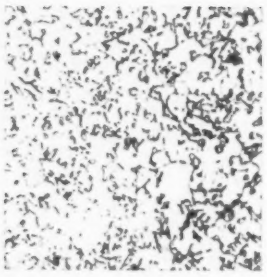
Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure to weather.

TPA 248

Gates Super VULCO ROPE Drives

carbon-restored steel meets tightest specs





This steel mill easily meets the steadily tightened specifications of customers who demand stock with good surface finish, no "decarb," and uniform microstructures suitable for cold forming and automatic machining.

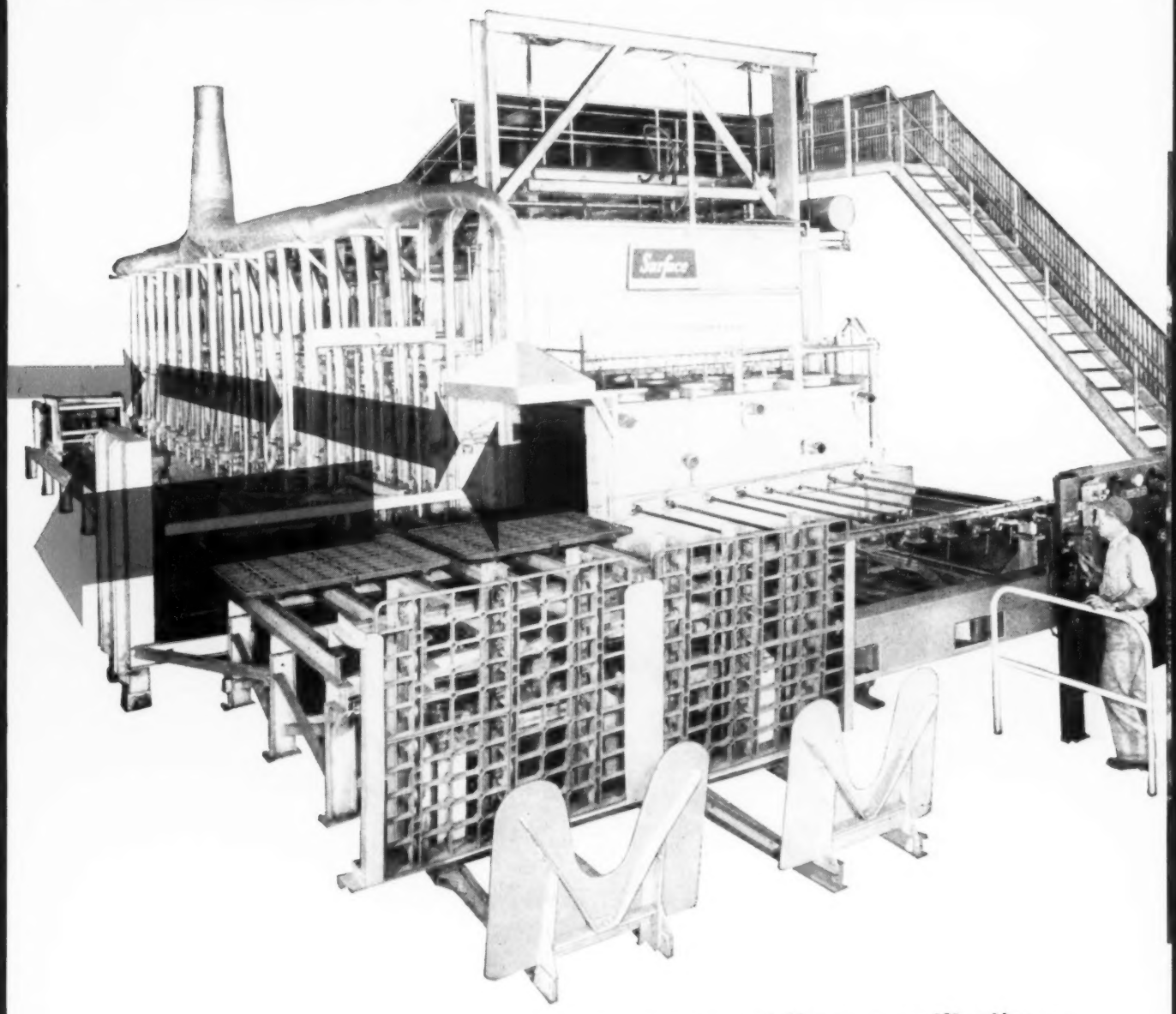
They do it by combining annealing and carbon restoration in a Surface continuous furnace. They get all the flexibility of cycle control they need with 6 zones, individually controlled. An RX® gas generator keeps the carbon potential of the furnace atmosphere in balance with the steels being treated. Automatic dew point recorders provide a continuous check on the atmosphere.

Production rates up to 1,000 tons per month make this furnace a profitable tool.

Again, Surface engineering transforms difficult specifications into profitable opportunities.

Surface Combustion Corporation, 2402 Dorr Street, Toledo 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

ASSOCIATED COMPANIES: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S. A. Belge, Stein &



you can meet these specifications:

CYCLE ONE (sub-critical anneal)		CYCLE TWO (over-critical anneal)	
STEEL (AISI)	MAXIMUM-BRINELL	STEEL (AISI)	MAXIMUM-BRINELL
4042	160	4037	151
4140	170	4140	174
5140	166	8127	148
8740	170	8740	174

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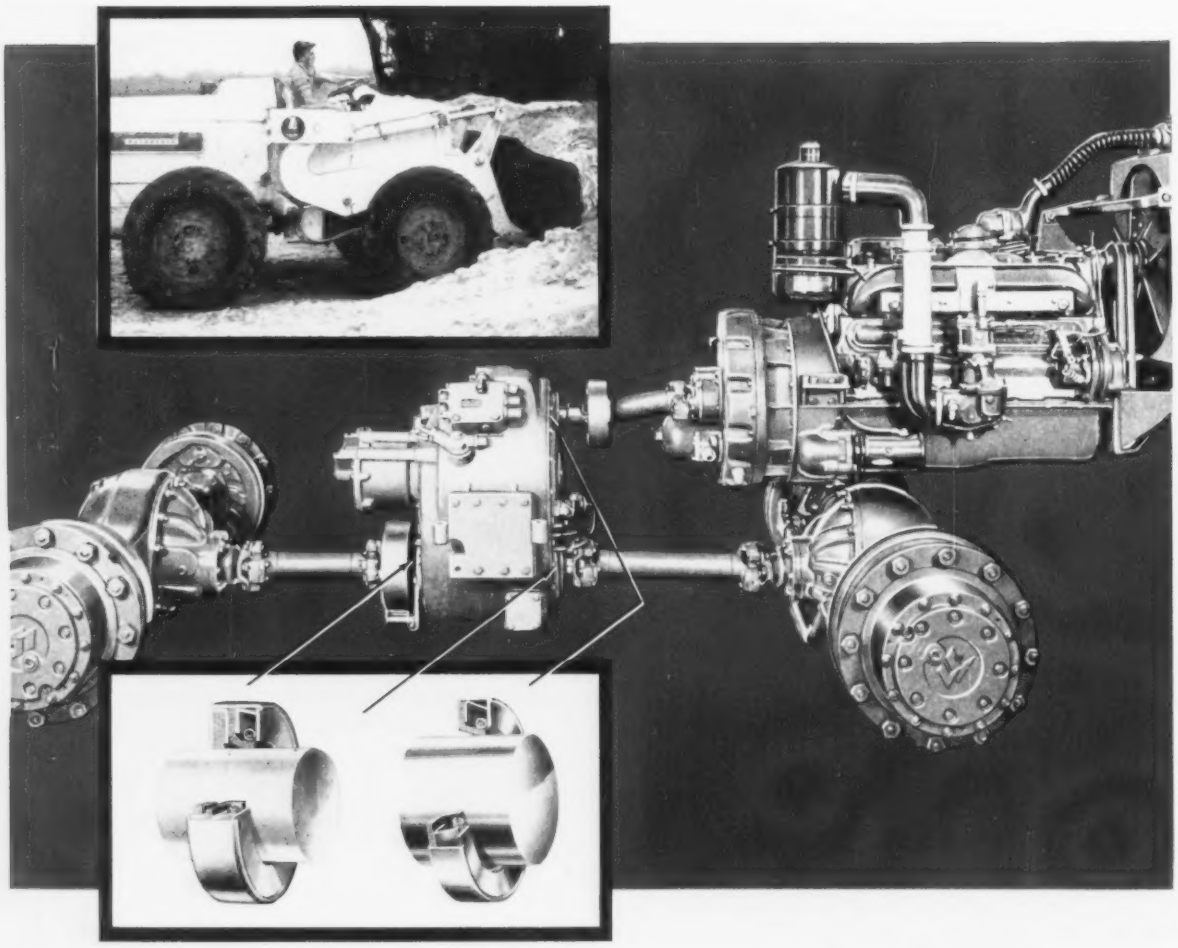

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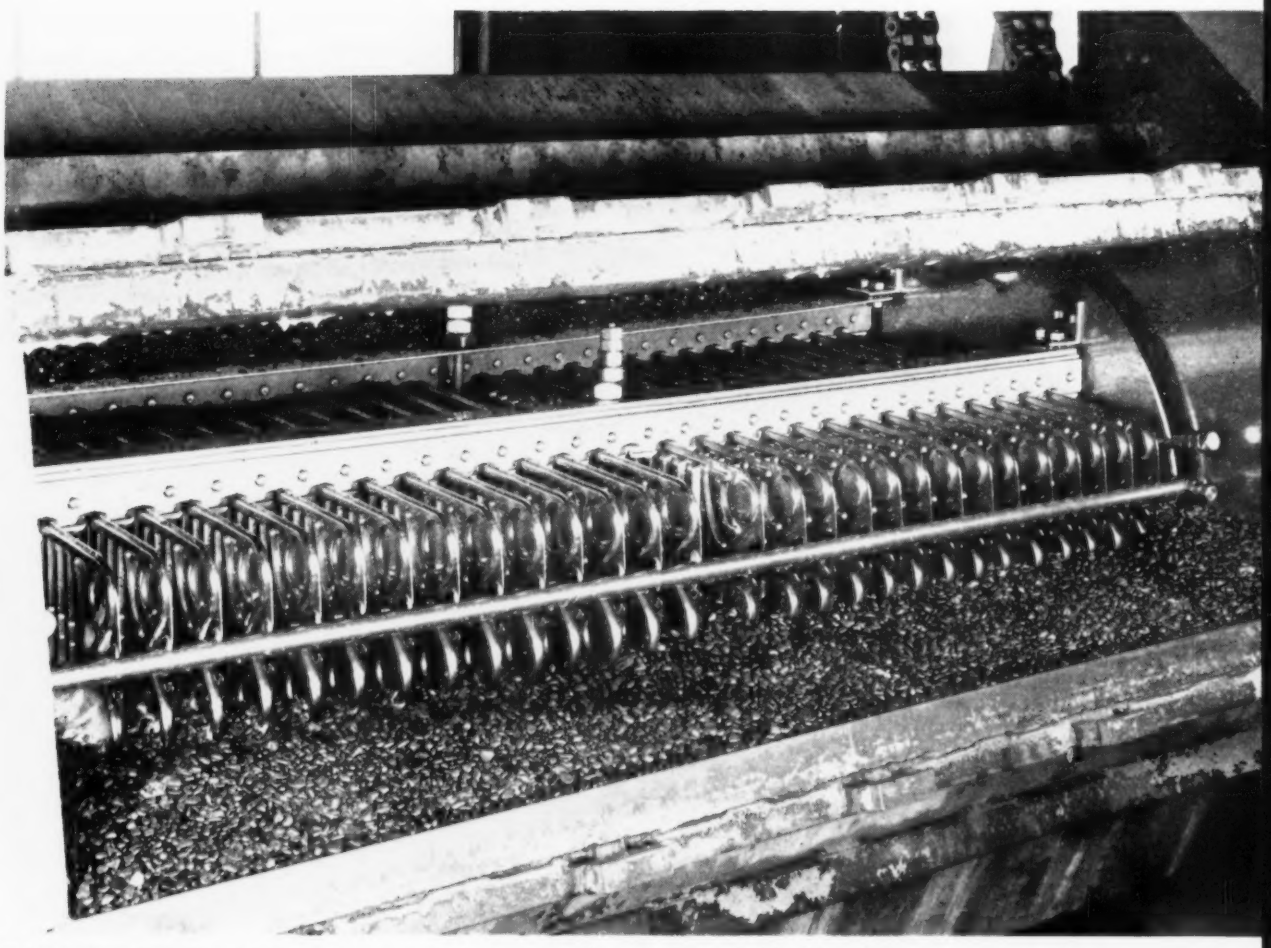


RACK 'EM UP: Special fixture extends between barrel's end plates, holds 28 stainless pasteurizer plates.

Why Not Tumble Big Parts?

By W. E. BRANDT—Vice President, Lord Chemical Corp., York, Pa.

Deburring large parts by hand is horse-and-buggy stuff to devotees of barrel finishing.

It's costly, time consuming and usually quite unnecessary they claim.

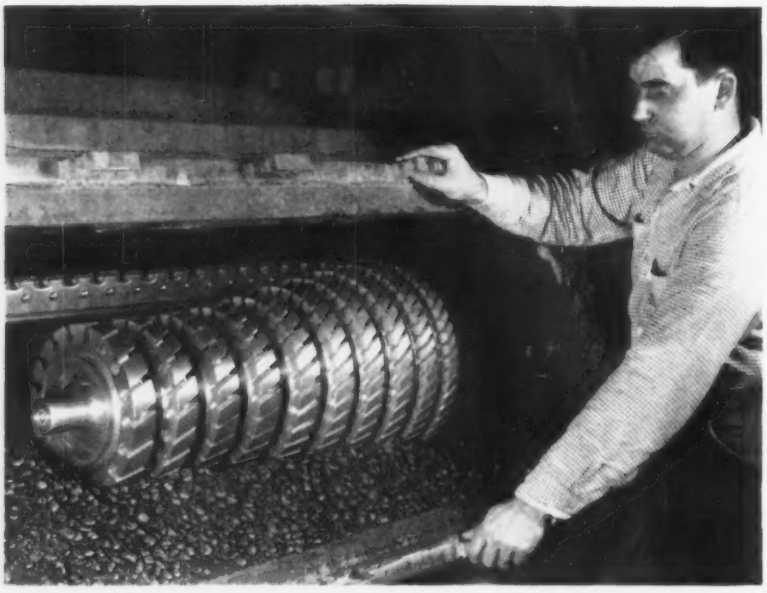
How large a part can be tumbled successfully? Here's one company's answer.

▪ Although barrel finishing is usually associated with small parts, there is no definite limit on the size of workpieces that can be precision finished in this way.

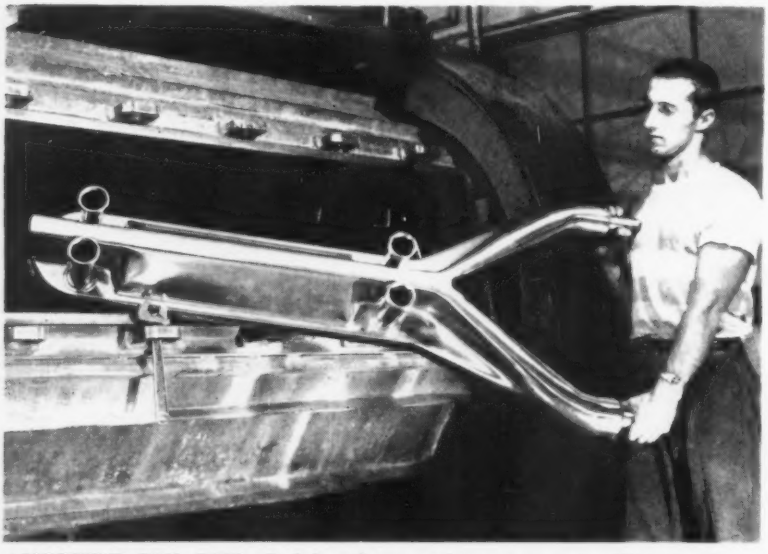
It all depends on how big a tumbling barrel is available. For example, jet engine rotor assemblies weighing over 1000 lb are tumbled successfully, even though they're hoisted in and out of barrels.

Although Lord Chemical Corp., York, Pa., doesn't handle work of this extreme size, the firm does have a 72 cu-ft capacity barrel in its production finishing department. It uses this equipment regularly to tumble a variety of large, heavy objects.

Fixtures Help—Such workpieces are usually tumbled with the aid of fixtures, in contrast to so-called



HEAVY JOB: Despite its tapering slots, 180-lb aluminum rotor is easily fixture-tumbled with a 50-50 mixture of small and large chips.



ANOTHER BIG ONE: Stainless heat exchanger part is 57½ in. long, is fixture-tumbled to remove grinding lines and produce luster.

"free" tumbling. With the fixture technique, the firm finds that high chip loads, low speeds and ample cushioning are often essential. Moreover, for uniform results, barrel rotation must be reversed midway in the cycle.

These principles are illustrated in the barrel finishing of an aluminum rotor weighing about 180 lb. A single two-hour cycle on this part completes all the required deburring, forming of radii, surface finishing, cleaning and final coloring.

A fixture holds the rotor in the center of the barrel so it cannot move. To avoid damaging the relatively soft aluminum surfaces, the rotor is completely covered by at least one inch of fused aluminum oxide chips in mixed sizes.

Fully Packed—This represents a very high chip load, 75 pct of compartment capacity in the 72 cu ft barrel. Added to this is 30 gal of water and a quantity of special aluminum-tumbling compound. The barrel rotates an hour each in both a forward and reverse direction at 10 rpm to complete a full cycle.

Many types of fixtures can be used to hold large, heavy parts. Certain styles may be attached to either the door, sides or end plates of a tumbling barrel. Some can be separate units that are loaded and unloaded outside the barrel. Still other "fixtures" can be made by tying individual workpieces together.

Make Quick Changes — Moreover, a single barrel can accomodate a variety of fixtures for finishing large parts. For example, the end plates of Lord Chemical Co's 72 cu-ft barrel are drilled for quick mounting of assorted work-holding devices.

One such fixture extends the full length of the barrel to hold stainless steel plates for milk pasteurizers. The plates are rough stampings made from type 304 stainless, 0.038 in. thick. They vary in length and width up to a maximum of 44 x 16¼ in.

The rack-type fixture holds from 26 to 30 of these plates, depending on their size. Deburring and removal of the original pickled finish is done in an initial 5 hour run of 2½ hours in each direction at 14 rpm. This requires a 60-pct mixed chip load, a non-abrasive cutting compound and a water level two inches below the mass.

Second Cycle Cleans—The plates are cleaned and burnished in a second run of two hours forward and two hours reverse rotation. This requires an all-purpose coloring and burnishing compound; in addition, the water level is brought up even with the mass.

Many other large stainless parts are fixture-finished in the same barrel by essentially the same technique. Examples include a 57½-in. long heat exchanger frame which is processed to remove grinding lines and produce a lustrous finish; and stainless lids and frames for ice cream cabinets.

Rails Carry Load—For fixturing certain large workpieces, rails are bolted to the barrel's end plates. In one case, these rails hold as many as 18 cam shafts in one load for a single cycle deburring and coloring operation.

The job calls for a 55-pct capacity load of mixed chips, necessary compound and a water level equal to the height of the mass. Barrel rotation is 1¼ hours in each direction at 8 rpm.

Smaller and less heavy parts are often tumbled efficiently in a cage-type fixture. Lord Chemical uses this technique with helicopter tension-torsion straps made from stainless steel. The part-filled cage is tumbled free in a 6½ cu-ft compartment with a chip mixture load between 55 and 60 pct of capacity.

Deburring and forming of radii takes 5 hours at 16 rpm. In this case also, rotation direction is reversed at the mid-cycle point.

BATCH FINISHING: Rails bolted to barrel end plates permit fixture tumbling from 12 to 18 carbon steel cam shafts simultaneously.

Devise Handy Rig — The firm also developed a universal tumbling fixture for heavy parts which often saves the cost of expensive special equipment. It fits any hexagonal or octagonal horizontal barrel.

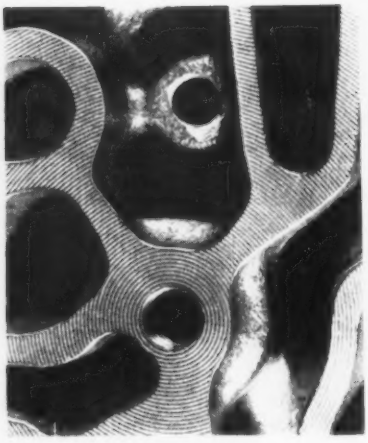
Each of the fixture's eight frames will accommodate either four chains or four spring-loaded rods covered with rubber hose. This provides a minimum of 8 and a maximum of 32 loading stations. Each station will hold one or more parts, depending on their size.

The fixture's "Ferris-wheel" design permits rotating these stations to the compartment door for easy loading or unloading. However, a clamp prevents the fixture from turning during the finishing cycle. This insures that valuable pieces can be processed without danger of nicking.

Keeps Ridges Sharp — One job handled on this universal fixture is a bronze part for a water softening unit. One face is machined to produce a series of narrow, thread-like ridges that resemble phonograph-record grooves. Because these

NO CONTACT: Cage-type fixture holds stainless helicopter straps, keeps parts separated as it tumbles freely in a three-run cycle.

FITS MOST BARRELS: Universal tumbling fixture provides a maximum of 32 part-loading stations on its chains or rubber-covered rods.



HOLDS THE RIDGES: Hand finishing each finely grooved bronze part for a water softener (left) formerly cost $5. Now, when tumbled in batches of 24 with the "Ferris-wheel" fixture, 90 pct of cost is saved. Deburring and formation of radii (right) do not obliterate grooves.

FREE TUMBLING: Aluminum and zinc parts weigh 5 to 8 lb, are "layered" with wooden or rubber blocks to stop nicking.

ridges must bite into a gasket to form a seal, they must remain sharp and high.

Hand finishing of these parts formerly cost the manufacturer $5 each. Barrel finishing now does a better job and saves 90 pct of the hand finishing cost. It successfully deburrs the part and forms large radii at specific points without obliterating the critical sealing ridges.

High Chip Load—In the actual finishing operation, each 13½ cu-ft compartment of a two-compartment barrel holds 24 of the fixtured parts. The mixed-chip load for the initial two-hour cutting cycle is 70 pct of compartment capacity. Added to this is 8 gal of water and 8 oz of a liquid compound for copper alloys.

A five-minute cleaning cycle, using additional water, follows the initial two-hour run. A final burnishing cycle takes another 20 minutes.

Oddly enough, some large parts can be tumble-finished without any barrel whatsoever. In one such case, it was necessary to remove burrs from the spiral rifling on the inside of aluminum rocket tubes. Because the tubes were 22 ft long and only 5 in. in diam, power tools on flexible shafts could not do the job with any real degree of accuracy.

Makes Good Barrel—The problem was solved by putting a 50 pct chip load in each tube. When water and compound was added and the tube ends capped, each tube literally became a tumbling barrel in itself. A system of rollers was devised to turn several tubes simultaneously.

Direction of tube rotation was reversed every five minutes during a two-hour deburring cycle. This counteracted the spiral conveyor action of the tube rifling which moved the chip load to one end of the tube in exactly five minutes.

Certain other relatively heavy workpieces can often be tumbled free, without the use of fixtures. In the Lord Co.'s shop, a variety of parts weighing up to 12 lb are regularly precision finished in this way.

Prevents Nicking—Sturdy parts are simply dumped in with the chip load. But where there is danger of nicking, the firm may (1) include about 10 pct of a much larger chip than is needed, (2) use rubber or wooden blocks to keep parts separated, (3) increase the load to 70 or 75 pct of compartment volume, (4) cut rotational speed, and (5) lower the water level.

The usual procedure for free tumbling is to first load in a layer of chip mixture and then add a row of workpieces interspaced with blocks. These parts are covered with alternate layers of chips and more workpieces until a relatively high load level is reached.

Rubber Blocks Best—The firm prefers rubber blocks to wooden ones in "layering" to prevent nicking of parts. Wooden blocks float to the surface when high water levels are used for burnishing cycles.

Although small chips increase the time necessary to complete a finishing cycle, the company considers a mixed chip load to be an economy. It avoids the unloading and reloading that is necessary when a single large size is used for rough cutting and a smaller-size chip for fine finishing.

Moreover, while water itself is a cushioning agent, a lesser amount increases the cushioning effect of a given amount of compound.

The company has studied precision barrel finishing of large parts from the standpoints of economy, uniformity, and efficiency of production scheduling. Based on its own experience, it recommends the technique highly.

Boron Solves "Hot Shortness" In Stainless Steels

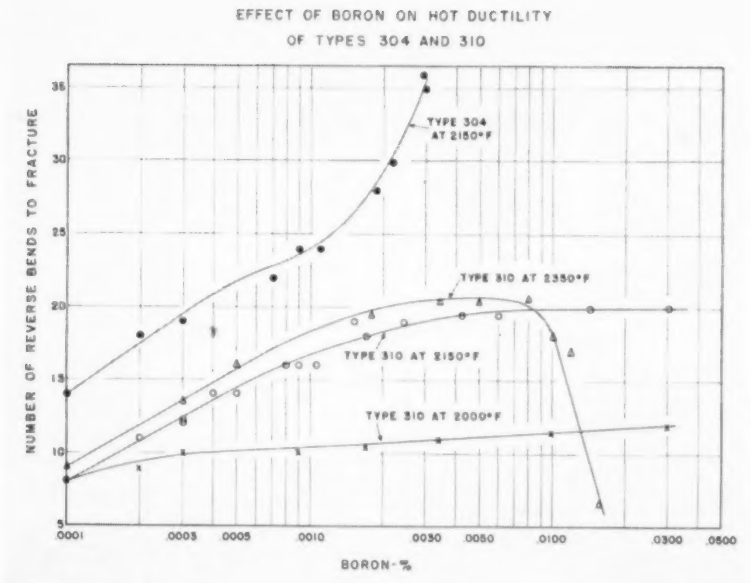


FIG. 1: Hot ductility of stainless Types 304 and 310 is remarkably improved by minor boron additions, eliminating "hot shortness."

Table 1: Effect of Boron on Hot Bend Ductility Values of Typical Alloys

Type No.	C	Cr	Ni	Others	Pct Boron Added	Number of Hot Bends at 2000°F	2150°F	2300°F
304	0.065	18.00	9.00	—	None	12	14	21
					0.0007	17	22	24
316	0.065	17.50	13.00	Mo 2.25	None	13	9	9
					0.0021	19	18	10
310	0.100	24.50	20.15	—	None	8	9	9
					0.0031	8	17	17
330	0.060	15.50	34.75	—	None	8	8	10
					0.0022	11	12	9
(20-28)	0.040	20.50	29.00	Mo 1.75	None	5	6	
				Cu 3.00	0.0024	14	15	

By **D. L. Loveless**—Melting Superintendent (Baltimore Works) and **F. K. Bloom**—Research Metallurgist, Armco Steel Corp., Middletown, O.

Just a tiny amount of boron seems to make the big difference.

It guarantees maximum yield of austenitic stainless mill products by vastly improving hot working performance.

It also helps eliminate reheatings and costly grinding operations needed to remove surface defects.

▪ Austenitic stainless steels—especially the high alloy grades—are prone to "hot shortness." This low ductility at hot working temperatures causes cracking or tearing in rolling and forging operations.

Improve Ductility—A recent discovery made at Armco Steel Corp.'s Baltimore Works significantly improves the hot working performance of these troublesome alloys. Small additions of boron, it was found, produce a marked increase in the hot ductility and workability of these materials.

The discovery was made in the melting department of the Baltimore Works during a study of flux additions to molds. It was noticed that when small quantities of rasorite ore (sodium tetraborate) were added during teeming, the resultant ingots showed remarkable improvement in hot mill performance.

Production Proved—Further checks revealed that equal or better results were possible by making such additions to the ladle. Since

Table 2: Comparison of Various Addition Agents on Hot Bend Ductility of Type 310 (25Cr-20Ni)

Additions to Melt, Pounds per Ton	Pct Boron Added	Number of Hot Bends at 2000°F	2150°F	2300°F
None — Control (Average results)	None	7-9	8-10	8-10
Boron Agents				
.13# Rasorite(1)	0.0005	9	14	16
1.7# Rasorite(1)	0.0023	10	17	17
1.7# Rasorite 2# Calcium Silicon, 4# Ferrotitanium	0.0020	10	18	21
.9# Borosil(2)	0.0018	9	16	18
8.0# Grainal #79(3)	0.0012	7	17	14
1.6# Ferroboron(4)	0.0019	10	16	14
Others				
2# Calcium Silicon, 4# Ferrotitanium	None	8	11	10
2# Cerium Carbonate	None	7	11	10
5# Rare Earth Oxides	None	7	14	9
3# Rare Earth Oxides, .6# Calcium Boride	0.0030	9	15	20
5# Misch Metal	None	7	17	20
5# Misch Metal, 19# Borosil	0.0028	8	22	28

(1) $Na_2B_4O_7$. 4 H_2O, Contained Boron 21.5 pct.
(2) B-3.4 pct, Si-43 pct, Fe balance.
(3) B-0.50 pct, Al-13 pct, Ti-20 pct, Zr-4.0 pct, Si-5 pct.
(4) B-11.0 pct, Fe balance.

Table 3: Satisfactory Boron Additions for Various Grades

Type No.	Nominal Composition Pct			Boron Addition Pct	Comments
	Cr	Ni	Others		
202	18.0	5.0	Mn 9.0	0.003 0.0010	Limited to applications where grain boundary precipitates not objectionable.
302	18.0	9.0		0.003 0.0010	same as above
304	18.5	9.5		0.003 0.0010	Good for plate and bar applications. Sheet and strip may show precipitates.
304L	18.5	9.5	C .03 mx.	0.003 0.0010	same as above
308	20.0	11.0		0.0010 0.0030	Excellent for off-balance compositions for welding wire.
309	23.0	14.0		0.0020 0.0040	Excellent for high-temperature applications where precipitates not significant.
310	25.0	20.0		0.0020 0.0060	Excellent for high-temperature applications where precipitates not significant.
316	17.0	12.0	Mo 2.5	0.0003 0.0010	Excellent for all applications. Molybdenum prevents precipitates.
316L	17.0	12.0	Mo 2.5 C .03 mx.	0.0005 0.0010	Excellent for all applications. Molybdenum and low carbon prevent precipitates.
317	19.0	12.0	Mo 3.5	0.0005 0.0010	same as Type 316
329	27.5	4.5	Mo 2.5	0.0020 0.0050	same as Type 310
330	15.0	35.0		0.0020 0.0050	same as Type 310

then, hundreds of tons of stainless steels of various grades have been successfully treated for improved hot workability.

Laboratory tests have shown conclusively that boron will increase the hot ductility of all common Cr-Ni and Cr-Mn austenitic steels at hot working temperatures. Sometimes the degree of improvement is 100 pct or more.

Hot Bend—Some of the results obtained where the hot bend test was used to evaluate ductility are summarized in Tables 1 and 2. The hot ductility characteristics of boron-containing Types 304 and 310 are shown in Fig. 1.

For these tests, coupons were cast in the shape of rods 9/16 in. diam. by 7 in. long. The rods were then machined to ½ in. diam. All specimens were heated in an electric furnace to the test temperature and soaked for 30 minutes. After heating, specimens were quickly withdrawn from the furnace, placed in a jig, and bent back and forth through 180° to fracture.

Broad Range—As Table 1 shows, additions of boron greatly increase the hot ductility of stainless steels over a wide range of composition. Any predominantly austenitic steel appears to benefit from such additions. Any convenient source of boron oxides, borides, or ferro alloys is effective.

There is some indication that the best results are obtained and more uniform recoveries achieved if the addition agent is accompanied by common deoxidizers such as calcium-silicon and ferro-titanium. Additions are normally made to the ladle when the heat is cast.

Laboratory results also indicate that the combined use of boron treatment with rare earths or rare earth oxides may be more effective than use of rare earths alone.

Small Additions—The amount of boron needed to produce a measurable increase in hot ductility is extremely small. Raising the boron content of Type 304 to 0.0005 pct increased hot bend ductility by 50 pct, a vast amount of improvement.

As little as 0.003 pct boron in Type 310 more than doubled the number of hot bends at 2150° and 2300°F. Generally, the greatest increase in ductility occurs in the range of about 2100° to 2400°F. Even at 1700°F, the boron-treated material is more ductile.

Very large boron additions are not desirable. Boron appears to have a relatively low solubility in these steels. When the boron content exceeds about 0.002-0.005 pct, faint traces of an intermetallic boride appear. Over 0.010 pct, the amount becomes appreciable and eutectic in appearance.

Avoid Eutectic — This eutectic form appears to melt at progressively lower temperatures as the boron increases. In Type 310 with 0.018 pct boron or more, this melting occurs around 2350°F. Effects on hot ductility (see Fig. 1) are disastrous.

Boron additions to austenitic stainless steels do not have a marked effect on ingot structure, grain size, or total nonmetallic content. Evidently the morphology of nonmetallic inclusions is altered. These are more plastic at rolling temperatures.

Improved hot mill performance can be obtained with grades other than those shown in Table 1. Type 308 which, because of composition limits, normally possesses unfavorable duplex austenite-delta ferrite structures, has been rolled with good results. Grades such as Types 316, 316L, 317, 317L, 309, and 310—all of high alloy content and difficult to work—respond remarkably to boron additions.

Prior to the use of boron, it was not uncommon for half of all Type 316 heats to tear badly when hot rolled from 13 in. ingots to 4 in. square billets. Frequently, rolling was stopped at 6 in. square to allow for grinding or reheating before finish rolling to 4 in.

Newer Alloys—Additions to the high-manganese, high-nitrogen austenitic alloys have also proved highly effective. A typical example is the Armco 21-4 N grade. Composition of this grade is: C 0.55 pct, Mn 8.50 pct, Cr 20.50 pct, Ni 3.50 pct, and N 0.40 pct.

This alloy retains extremely high hardness at elevated temperatures. Because of this desirable property, it is more difficult than usual to hot work.

Adding about 0.0003 to 0.0006 pct boron to this steel increased yields from ingot to shipped bar by 3 pct. It also visibly improved the performance in hot extruding bars into automotive exhaust valves.

Boron additions to stainless steels occasionally cause the appearance of a grain boundary precipitate in the annealed structure of the finished product. This precipitate appears if material cools too slowly from the annealing temperature.

Possible Effects—While the phenomenon is still being studied, it appears that boron may have two effects. It may precipitate a compound of some type that is independent of the presence of carbon and may be an intermetallic boride. Secondly, boron may accelerate the rate at which normal chromium carbide (or possibly boro-carbide) will precipitate on cooling from the annealing temperature.

The boride precipitate does not appear to adversely affect corrosion resistance. Still, it has been the practice to limit boron additions to low enough levels to avoid formation of either borides or carbides. The single exception applies to those materials intended for use in the carbide precipitation range and where such precipitation is known to be harmless.

Table 3 lists the levels of boron known to be satisfactory in several grades from both a hot working and structural standpoint.

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New Furnace Heats To 6000°F—In Minutes

By P. M. Unterweiser—Metallurgical Editor

No, the 6000 F is not a misprint. It's amazing, but it's all fact.

This new furnace, designed and developed in Germany, actually melts pure tungsten in less than 5 minutes.

▪ "I think I'd still be skeptical—if I hadn't seen it with my own eyes."

That was the immediate reaction of a down-to-earth engineer after watching a new Lindner furnace go through its paces.

He had seen—and used—a lot of laboratory furnaces in connection with metallurgical research. But he had never before come across a furnace to match the Lindner.

Melts Tungsten—For, believe it or not, here are a few of the things the new furnace can do. It can achieve a temperature of more than 6000°F (3500°C) in less than 6 minutes. It requires about 5 minutes to melt samples of pure tungsten. It can liquefy crystals of zirconium oxide (melting point: 4892°F) in about 3 minutes.

For complete versatility, its design is such that it can do all or any of these jobs in air, under vacuum, or with the protection of a prepared atmosphere.

Developed in Germany, the new furnace will be built by Manufacturing Instrument and Tool Corp., Clifton, N. J. Production models are scheduled to be leaving the assembly line soon.

Special Contactors—Essentially, the Lindner is an electric resistance-type furnace. All models are designed to operate from a standard 220-volt power source. A demonstration model on view in Clifton is fed by a 12KW transformer. It can be controlled in either a 6 to 12, or 12 to 24 volt range, depending upon heating requirements.

A special feature of the Lindner design is its conically-shaped contactor. This design permits concentrating high current densities over a limited area.

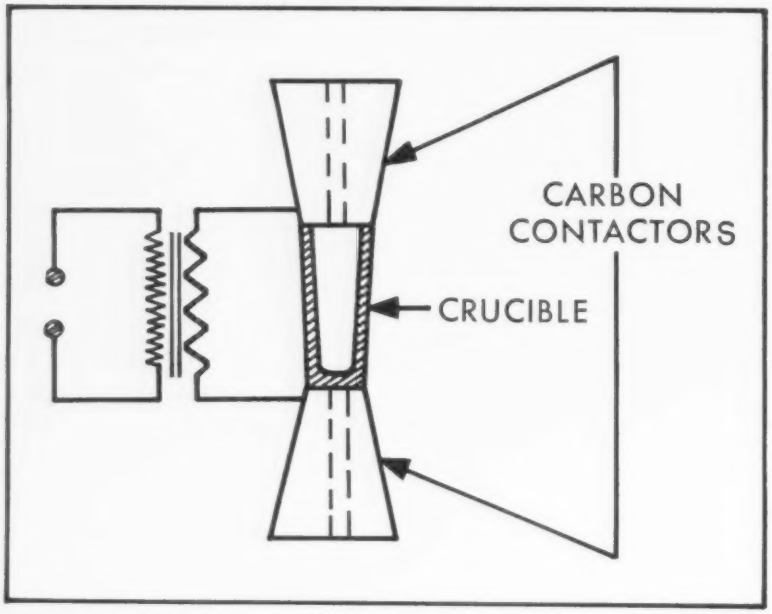
As shown in the accompanying diagram, two of these contactors are used to heat a charged crucible by means of electrical resistance. A wide range of power input is made available by any easy-to-manage step transformer.

Easy Control—Upper and lower bronze contact heads are water cooled. The transformer is manually controlled by a lever that ties in with any one of six separate power taps. Shifting from one tap to another to alter power input is at least as easy as shifting gears in an automobile.

Most important, the shifting can be done without breaking linkage contact. This arrangement partly accounts for the unusual heating speeds that can be achieved without intermittent power loss.

A variety of crucible materials can be used to hold the charge. Carbon, graphitic clay, and a number of common refractories have already been tried. The geometry of the crucible need not be limited to a particular shape. It can be varied in many ways to meet operational requirements.

Highly Versatile — Depending upon power input and the properties of the crucible material, the



BASIC DESIGN: Lindner unit is a resistance-type furnace, works off a standard 220-v line. Conical contactors are a key feature.

crucible can be quickly heated to incandescence. Maximum temperature that can be obtained in a matter of minutes is estimated to be about 6400°F.

Because the entire heating chamber, including the contactors, is mounted on trunnions, the crucible can be tapped from top or bottom. Or it can be poured by tilting.

The position of the crucible during the heating cycle can be similarly varied. Both contactors and crucible are effectively insulated against heat loss by means of carbon pellets.

Water Cooled—One of the new furnace's major selling points is the ease with which it can be installed and placed in operation. The transformer can be plugged into any standard 220-volt line. A simple connection to bring in ordinary tap water is enough to take care of cooling the contact heads.

To heat a charge, the crucible is placed between the upper and lower contactors. The upper contactor is then cranked downward to firmly clamp the crucible in position. If desired, the charge can then be poured into the crucible via a hole bored vertically through the upper contactor.

Good Insulation—Next, the steel housing doors are closed. Carbon pellets are poured into the space that separates the housing from the actual heating unit. In addition to providing insulation, these pellets also prevent excessive oxidation of both the heated crucible and the carbon contactors.

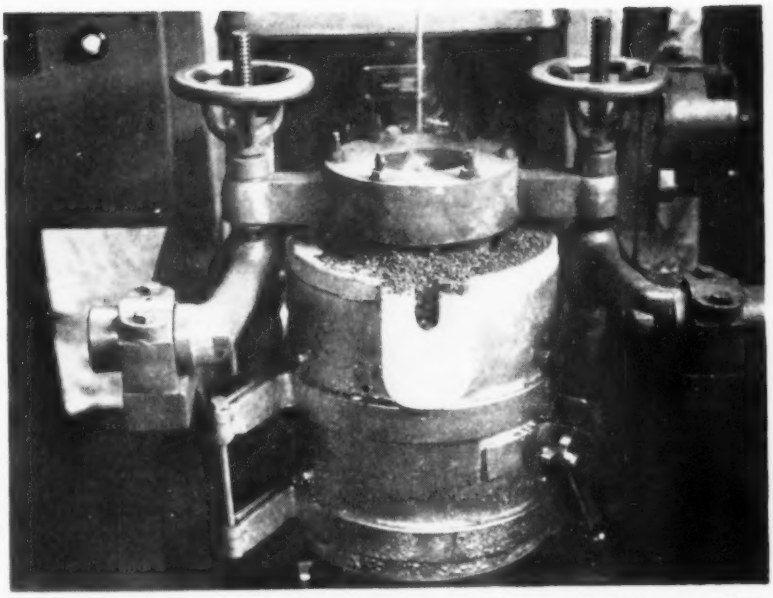
Throughout the heating cycle, power input is controlled by making use of the various transformer taps.

According to current estimates, there are about 2500 Lindner furnaces in use in Europe today. While most of these are being used in research laboratories, some are actually being used for small production heats.

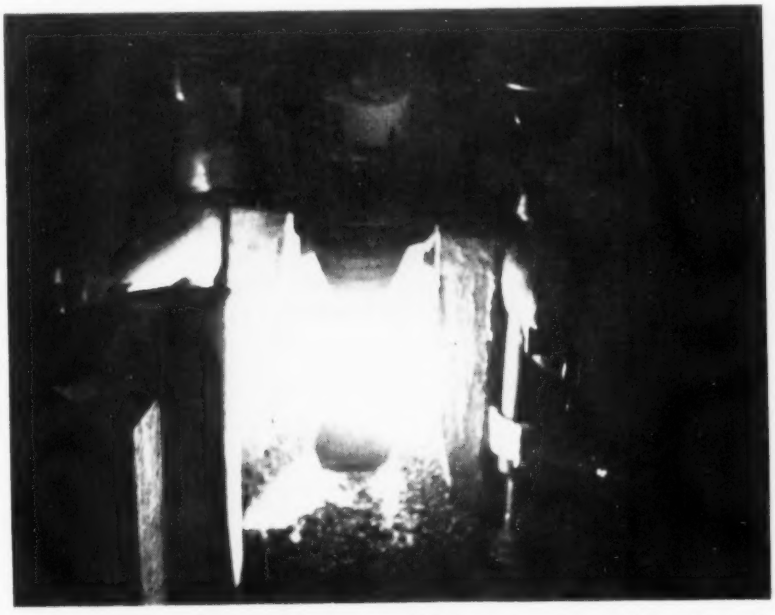
Production Heats—The Lindner design is such that electrical engineers claim it can be readily adapted to handle production-size heats. This can be accomplished by simply increasing transformer capacity and enlarging the size of individual components. The basic design, in other words, can be scaled either upward or downward in terms of size and capacity.

Despite the high current densities involved during operation, none of the exposed areas of the unit is at all dangerous to the operator. Insulation and shielding are entirely adequate, so that none of the exposed areas tends to heat appreciably.

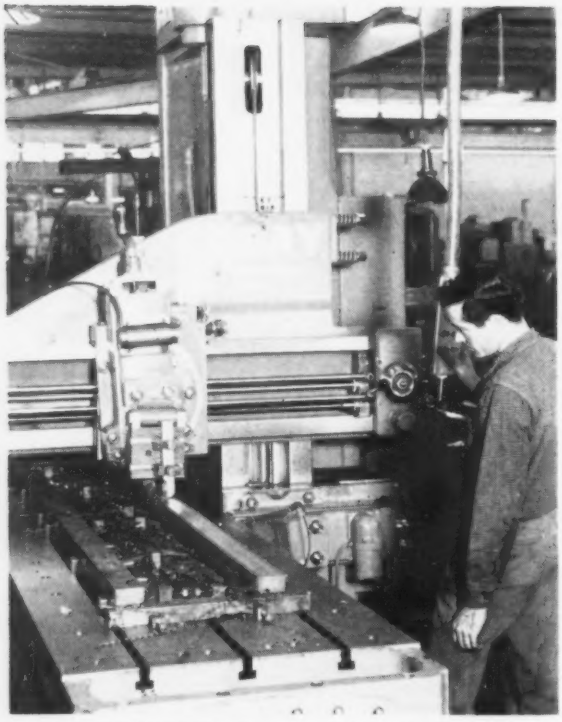
Thanks again to design features, the furnace claims a practically unlimited life. Only the carbon contactors and crucible are likely to wear or deteriorate. These can be easily replaced.



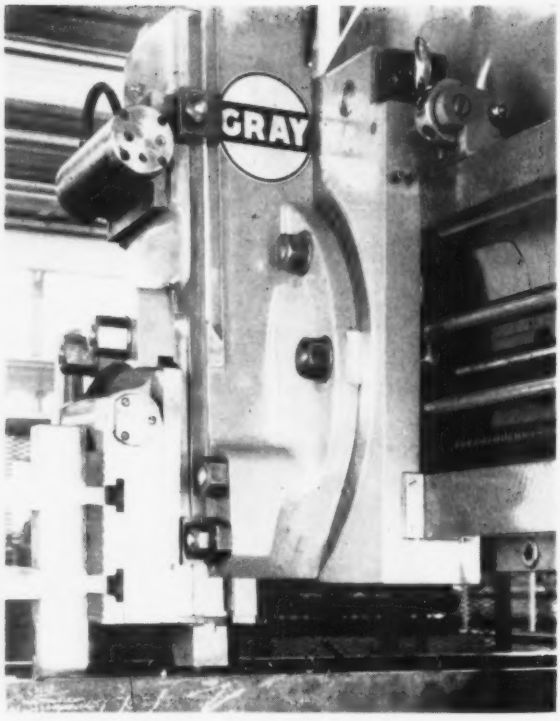
READY TO GO: Entire unit mounts on trunnions to facilitate pouring. Carbon pellets insulate between heating chamber and outer shell.



BLINDING HEAT: Incandescence at 6000°F obscures crucible. Furnace reaches this temperature in something less than six minutes.



NEW TECHNIQUES: Double and triple cutting methods speed planing jobs. Controls are simple.



TRIPLE CUTS: Broad-nosed tool in standard mounting works in conjunction with two-way tool.

Double Cutting Gives Planers A

By T. M. Rohan—
Cleveland Regional Editor

You can improve planers by speeding up return stroke. But you reach a practical limit.

Here's an approach that turns out better. Use the return stroke for cutting.

Gray has done this and found new tricks add to advantages of two-way cutting.

■ When an idle return stroke follows the cutting stroke of a planer, it can't help but cut down efficiency. You can only speed the return stroke so much, and even then the period of return is lost for cutting.

Design the planer to cut in both directions and you get maximum efficiency. It raises material removal rate and cuts down machining time.

The new Gray Universal planer with a double-cutting tool now takes equal cuts in both directions. It handles jobs up to 36 ft long on a production basis. The double-cutting tool mounted on an oscillating head uses standard stock carbide tips.

Since the G. A. Gray Co., Cincinnati, introduced the planer, many firms have found its advantages. Both openside and double-housing models feature double cutting.

Two-Way Planing Fast — One planer reduces machining time to a quarter of that formerly required. It's an installation at the Textile Machine Works, Reading, Pa.

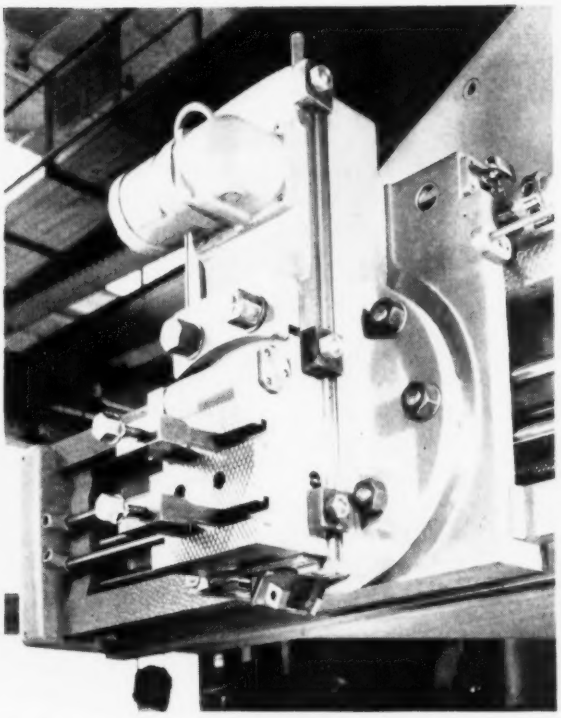
The planer is machining cast iron knitting machine bases. The iron castings now have a floor-to-floor time of 12 hours compared to 62 hours formerly.

The hefty Gray takes ½-in. cuts at a speed of 200 fpm in each direction. The feed is 0.050 in. per stroke or 0.100 in. per cycle. This is on material with tensile strength of 34,000 psi and Brinell Hardness (3000 kg) of 401-444.

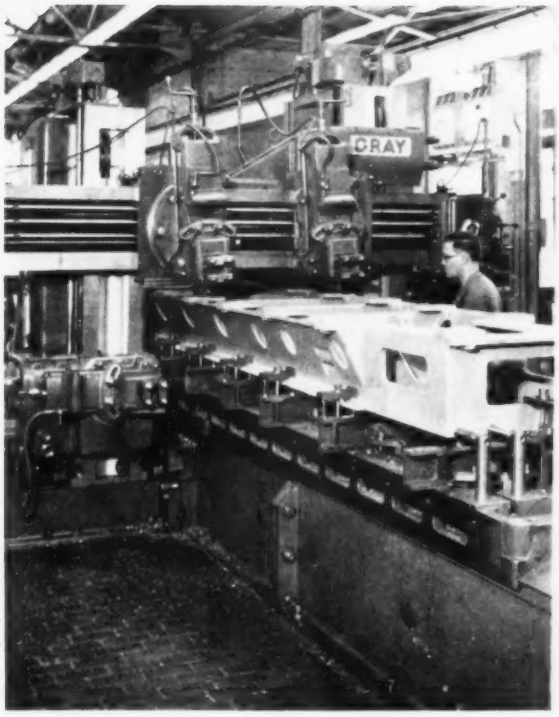
Textile Machine developed a variation of the tool holder to utilize small expendable clamp-on carbide tips.

It Converts—The Gray planer at Textile Machine is a 36 in. by 20 ft convertible openside planer. An auxiliary housing on a sliding outboard runway adjusts to width of work.

In effect you have the rigidity and convenience of the double housing design for normal work.



CARBIDE TIPS: The double cutting tool holder features expendible carbide tips.



IT'S CONVERTIBLE: You get the rigidity of double-housing planer with removable head on left.

Boost

For wide material you can remove the housing altogether.

Here's another feature. Split tables permit machining a piece on one section, while the other is parked, unloaded, and reloaded. You can actually eliminate set-up time when it is equal to machining time.

Triple Cutting—With the Gray planer, the new triple cutting technique gives you maximum machining rate. A rough finishing tool works in conjunction with double cutting tool. It means elimination of secondary machining entirely. Time for tool setting and changing is reduced.

It's ideal for machining shear knives. Here is performance data on knife blades 10 ft 4 in. long, 5 in. wide and 1⅛ in. thick:

On an existing old style planer using high speed tools, planing time is 100.8 minutes. With a new style planer with carbide tools, you can cut the time in half to 50.8 minutes. But the new Gray planer using the triple cutting technique is doing the job in 27.9 minutes.

Tools Coordinate — A regular broad-nosed tool is mounted in the tool box at a depth slightly below the double cutting tool. You set it to lag the two-way tool by a fraction of an inch in the direction of the head feed.

The double cutting tool does the roughing job while the rough finishing is done with the single point broad-nosed tool. If you require a precision finish, take a second pass with the broad-nosed tool without tool change.

The new Gray serves as a conventional planer for heavy duty single point carbide planing, but converts instantly to machine other jobs by utilizing the double and triple cutting techniques.

Design Rigid — Keeping rigidity in a two-way rotating head was the major hurdle. Gray has attained the rigidity with a patented square lock design.

A husky two-way spindle mounted in the head automatically rotates 13° at the end of each stroke. A positive stop absorbs the cutting thrust in each direction.

The tool holder mounts in the spindle. Rotation provides proper clearance for the idle carbide tip.

The heads have the traditional tool box and apron to make possible the triple cutting techniques.

With the records established by double and triple cutting, the Gray Co. sets the future pattern for successful planer design. Case histories point out the practicality of the new methods.

The planers have been installed in machine tool firms, tool and die works, as well as paper making and textile machinery shops. Installations at auto and aircraft plants have also made their mark.

Castings Machine Better With Water Coolants

By W. G. Patton—Engineering Editor

Ever hear of a plant that machines iron castings and yet remains dust free?

Here's one that is not only dust free, but is cutting costs by using wet machining techniques.

Furthermore the coolant here is water-soluble. Temperatures are lower. Chip disposal is easier.

▪ Bold use of water coolants is paying off in machining of automatic transmission parts. The Chrysler plant at Kokomo, Ind., gives wet machining techniques the nod over dry machining wherever possible.

Here are some of the results: (1) The plant is remarkably clean. (2) chip disposal is easy. (3) tool cost has been reduced. (4) the automatic transmission is easier to assemble and more trouble-free in service. (5) cost of coolants has been reduced.

No Dust—Elimination of flying dust, created in machining cast iron cases, is a major reason for the clean plant. After a year and a half of operation the plant looks like new. It promises to stay that way.

During the normal working day, the plant machines more than 1200 transmission cases. An unmachined casting weighs 75 lbs whereas a machined casting weighs 65 lbs. Removal of this amount of metal could raise a lot of dust. But it doesn't because of the wetting action of the liquid coolant.

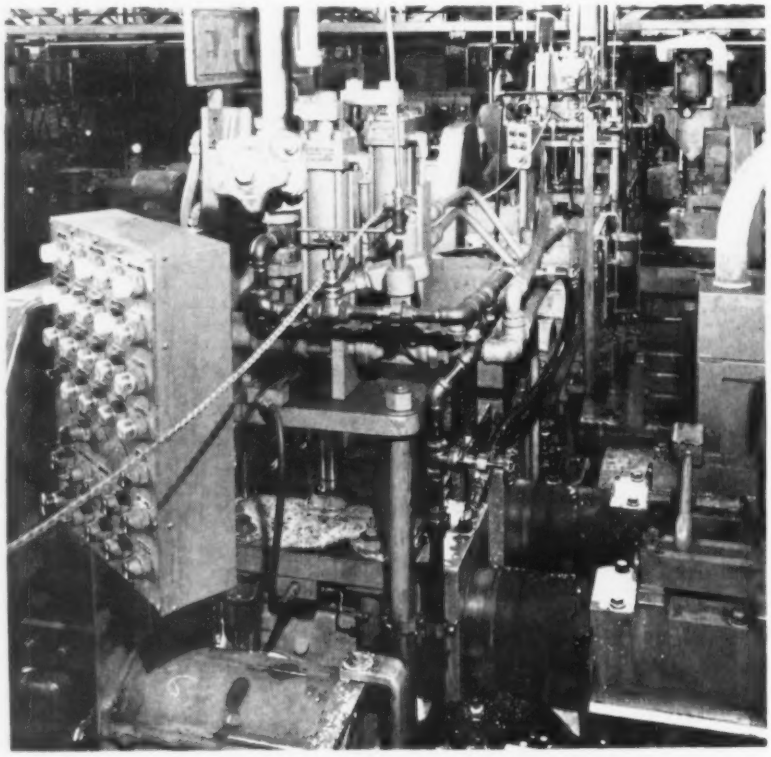
Automatic Cooling—On the transmission case line, castings move through 17 automatic machines. The coolant is turned on automatically at each machine as the tools move in.

In this entire line, all machining is done wet except for some minor operations that were not readily adaptable to wet machining.

Water-type coolants are specified whenever steel, gray iron, malleable or aluminum are machined. Eight under-the-floor flume systems collect and carry away the chips.

Cooling Adjustable—The coolant supply is adjustable, ranging from 1700 gpm for cast iron to as much as 4000 gpm for steel and automatic screw machines. Valve grinding areas, aluminum machining areas and case machining lines all have ample coolant flow for their particular requirements.

The system costs less to operate than most chip handling and cooling systems. All water-soluble coolants are cleaned prior to reuse. Cutting tool life is increased because coolants are kept relatively free of chip particles. The temperature of the coolants is kept low.



CAST IRON CASES: Water coolants aid in chip disposal at this end milling station. Extensive use lowers coolant cost.

Used With Mist—Specially designed mist lubrication systems have made it possible to use the water type coolants on multi-spindle automatics and chucking machines.

By keeping mist or fog lubricating systems at a pressure slightly higher than atmospheric, you can keep the water-soluble coolants out of the bearings. Chrysler engineers have adapted this system to nearly 90 pct of the automatics in the plant.

Cost Lowered — Studies show that, in addition to elimination of chip disposal problems, the cost of the coolants has been reduced on some machines as much as 15¢ per gal.

Except for a few drilling operations, tool life is about the same in comparing water-soluble coolant to oil coolant. You find the advantages favor water-soluble coolants in reduced coolant cost. They also make for lower operating temperatures.

Here's How — Let's see specifically how water-soluble coolants are being used. Take the machining of blanks for annulus gears. This is being done on a 6-in. 6-spindle Acme - Gridley automatic at 90 pieces per hour.

Stock is 5¾-in. OD hot-rolled Timken tubing. The steel is purchased in 12 ft lengths. Carbide tools are used. Two parts are finished with each indexing of the machine.

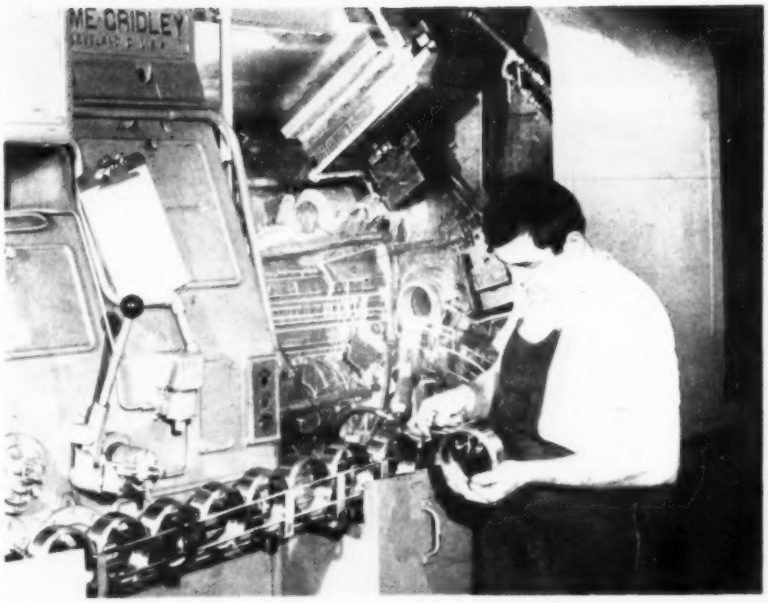
Using the water-soluble coolant the following operations are performed: (1) rough bore inside diameter, (2) ream inside diameter, (3) face, (4) and finish form outside diameter. Tolerances of ±0.005 in. are maintained for all principal dimensions.

Water Cooling Helps — Here's another example. A rate of more than 280 pieces per hour is being maintained by a special ⅝-in. RA 6 SPDL Acme in producing control cable adapters.

Eight automatic operations transform ⅜-in. diam stock into the finished pieces. The specifications call for SAE B1113 in 12 to 14 ft random lengths.

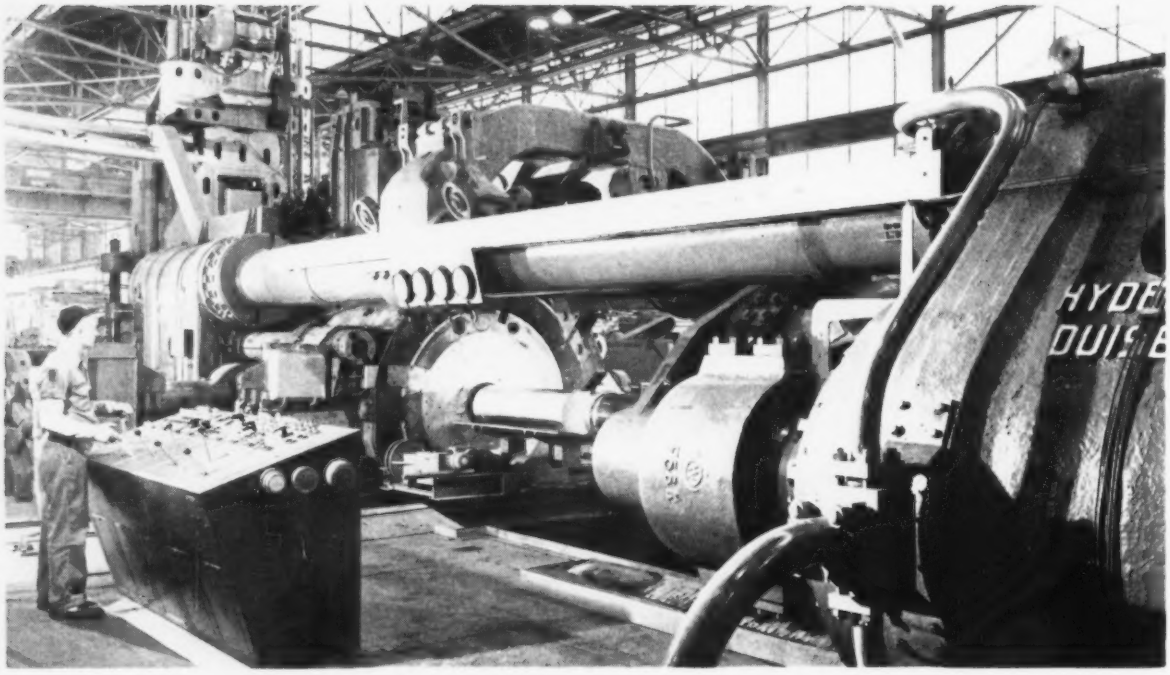
The machine has a unique feature in that three of the spindles stop automatically during each cycle. The set-up eliminates seven secondary operations.

The decision to use wet machining over dry machining and to use water-soluble coolants has been more than justified. More than 100,000 automatic TorqueFlite transmissions have been produced in the year and a half the system has been used at the Chrysler-Kokomo plant.



GEAR BLANKS: Control of water-soluble coolant is automatic when tool moves in. The wet machining lengthens tool life.

BAR STOCK USED: Eight automatic operations transform bar stock into finished pieces. Water coolant circulates continuously.



BILLET ENTERS: Ram controlled from operating console is about to push 16-in. billet into container.

Giant Press Extrudes Magnesium To New Forms

New design horizons appear for magnesium extrusions.

A giant hydraulic press puts to use its superior capacity. It extrudes sizes and shapes never before possible.

Larger extrusions offer an opportunity to combine separate parts into simpler one-piece extrusions.

▪ A giant 13,200-ton press, the largest yet built for extruding magnesium, proves to have a promising future.

Once it was destined to produce magnesium components for the German Luftwaffe. Now, at Dow Chemical Co.'s Madison, Ill., plant, it's poised to do a job for this nation's defenses.

The big machine has already squeezed its first production order: 18-in. structural sections of experimental portable landing mats for the Corps of Engineers.

Growing Field—In the aircraft and missile field, the potential applications are many. For instance, round hollow tubing can now replace formed sheet for missile bodies.

Design engineers can consider larger extruded forms for air frames and flooring for aircraft. Aerial drop platforms and bridge components are also feasible jobs for the giant press.

Such diverse fields as highway transportation, printing plates, and road construction should develop into good commercial markets.

The press is quite capable of extruding aluminum. The Air Force has asked Dow to produce a sizeable order of aluminum extrusions for the B-52 program.

Boosts Dimensions — Press capacity has limited dimensions of magnesium extrusions in the past. Here's how the big press boosts maximum dimensions of representative extrusions: Integrally-stiffened sections, from 9 to 20 in. wide; I-beams, from 11 to 28 in. high; round tubing, from 10 to 24 in. OD.

The press extrudes all shapes common to conventional equipment, plus several complex sections that have only been possible through series operation in the past.

A double locking frame enables the press to produce complex stepped extrusions, combined hollow forgings, and other forms normally difficult to push even in separate operations.

Heavy Piercer — It's equipped with an integral 3000-ton piercer for optimum simplicity in producing hollow extrusions. By using the piercer and double locking frame in conjunction, you can extrude such uncommon forms as hollow propellers.

The press features a three-cylinder, four-column design. Its horizontal cylinders and 26-in. diameter columns are forged steel.

Extrusion billets ranging from 16 to 32 in. diam convert into extrusions as long as 80 ft. Pressure stages are 3000, 5500, 7700, 9700, and 13,200 tons. It can exert a maximum hydraulic pressure of 130,000 psi on 16-in. diam billets. For 26-in. diam billets weighing 2240 lbs it takes 50,000 psi.

Pressure vs Ingot—With the relatively high ratio of pressure to ingot area, you can get extrusion of extremely thin-walled or bulky shapes impossible with the conventional 5500-ton equipment.

A 33,000 psi pressure is plenty high enough to extrude a 32-in. diam billet into large forging stock or even thick walled shapes.

With the higher pressures available, the big press can operate at lower extrusion temperatures. It means increase in compressive yield strength of extruded parts.

For example, the compressive yield strength of ZK60 alloy extruded at 700°F is 34,000 psi. It jumps to 37,000 psi when extrusion temperature is lowered to 500°F.

Favor Big Shapes—Where you have a premium on physical properties, the big press will extrude 50 to 100 pct larger shapes than possible on the 5500-ton equipment. Designers can now scrap specifications for combined smaller extrusions in favor of large integral sections.

The big press can extrude forging stock up to 18-in. diam. This is ample for the 35,000 to 50,000-ton forging presses in use today.

It gets hydraulic pressure from a 43,000-gal accumulator system consisting of 30 air and 6 water bottles. Four high pressure 176 gal per minute plunger pumps powered by 7000 hp motors put out pumping force. Pressure is 4267 psi.

Total weight of press and accumulator station is 2800 tons.

Auxiliary Equipment—The 1000-ton capacity stretcher for automatic straightening handles extrusions as long as 80 ft and up to 40 sq in. cross sectional area. It's gripper jaws hold extrusions up to 40 in. wide.

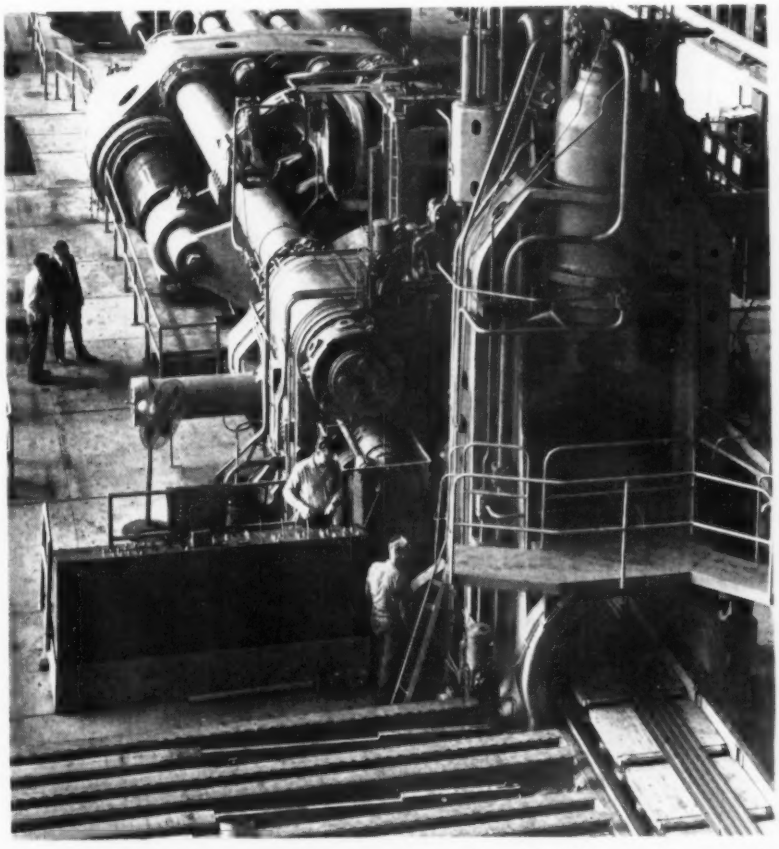
The induction billet heaters rate at 20,000 lb-hr capacity. The aging oven has a capacity of 320,000 lb. Four 390 hp blowers with input capacity of 300 hp provide 20 air changes per minute across the oven's 80-ft length.

The contour-correcting machine applies force from any direction on extrusions as large as 32 by 18 in. You get 60,000 lb pinch pressure and thrust of 17,000 lb.

The tube and round straightener handles solid rounds up to 16-in. diam and tubing up to 24 in. outside diameter and 2 in. wall thickness. It delivers bending pressures up to 532,000 lb.

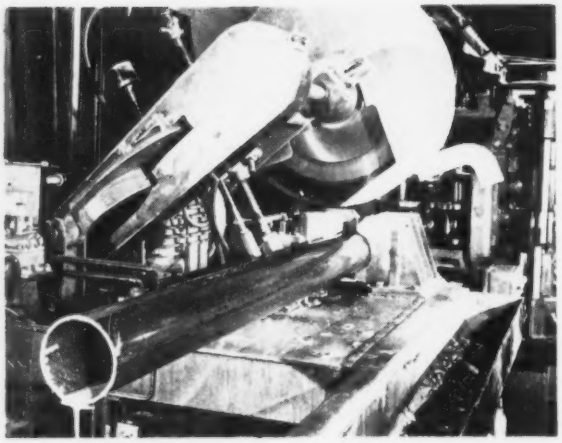
Colorful Background — At the end of World War II, American forces managed to acquire the big press, which was under construction by Hydraulik G.M.B.H. of Duisberg, Germany.

Dow is fortunate not only to be able to complete the building of the Hydraulik press, but to have the services of the man closely involved with the press since its inception in 1942. He is Karl T. Braueninger, light-metals engineer, currently manager of Dow's extrusion operations at Madison.



BUSINESS END: Extrusion emerges from die end. Difficult forms push through in one operation. The press makes larger dimensions possible.

HEAD WELDS FAST: Inert gas process insures penetration of weld. Preheat raises welding rate.



CUTS ON THE MOVE: Aluminum tubing never stops, as high speed saw follows in cutting lengths.

Welded Tubing Rolls From Forming Mill at High Speed

When you increase welding speed, you can't help but get the benefits of higher production.

The product is cheaper and more uniform. Large diameter aluminum tubing is no exception to this rule.

▪ Tube forming mills operate at high speed to stay in competition. It's the small refinements that count. Here's a mill that not only gets the high speed, but gets it on large-diameter aluminum tubing.

The refinements come in gas-shielded welding techniques. Kaiser Aluminum and Chemical uses such techniques in its new mill at Trentwood, Wash.

Preheat For Speed—The welded tubing, 6 to 10 in. diameter, rolls out of the forming mill at 35 fpm. A special oxyacetylene flame preheats to get the faster welding rate. The new mill, designed and built by McKay Machine Co., Youngstown, O., features Air Reduction Company's Heliweld process.

A double-end pay off reel feeds aluminum coil stock to the mill. In continuous operation, the machine forms, welds, and saws the tubing in 20 to 40 ft lengths.

As the coils pay off through leveling rolls, a shear trims the end of one coil and the lead of the next coil. A continuous sheet results by welding the two butt ends together.

Seven stands of rolls form the sheet into tubing. A soluble oil, sprayed for lubrication, prevents metal pick-up on the polished rolls during the forming.

Automatic Feed—The mill feeds the formed tubing under the Heliweld arc at uniform speed. Fin rolls hold the edges in accurate alignment during the welding.

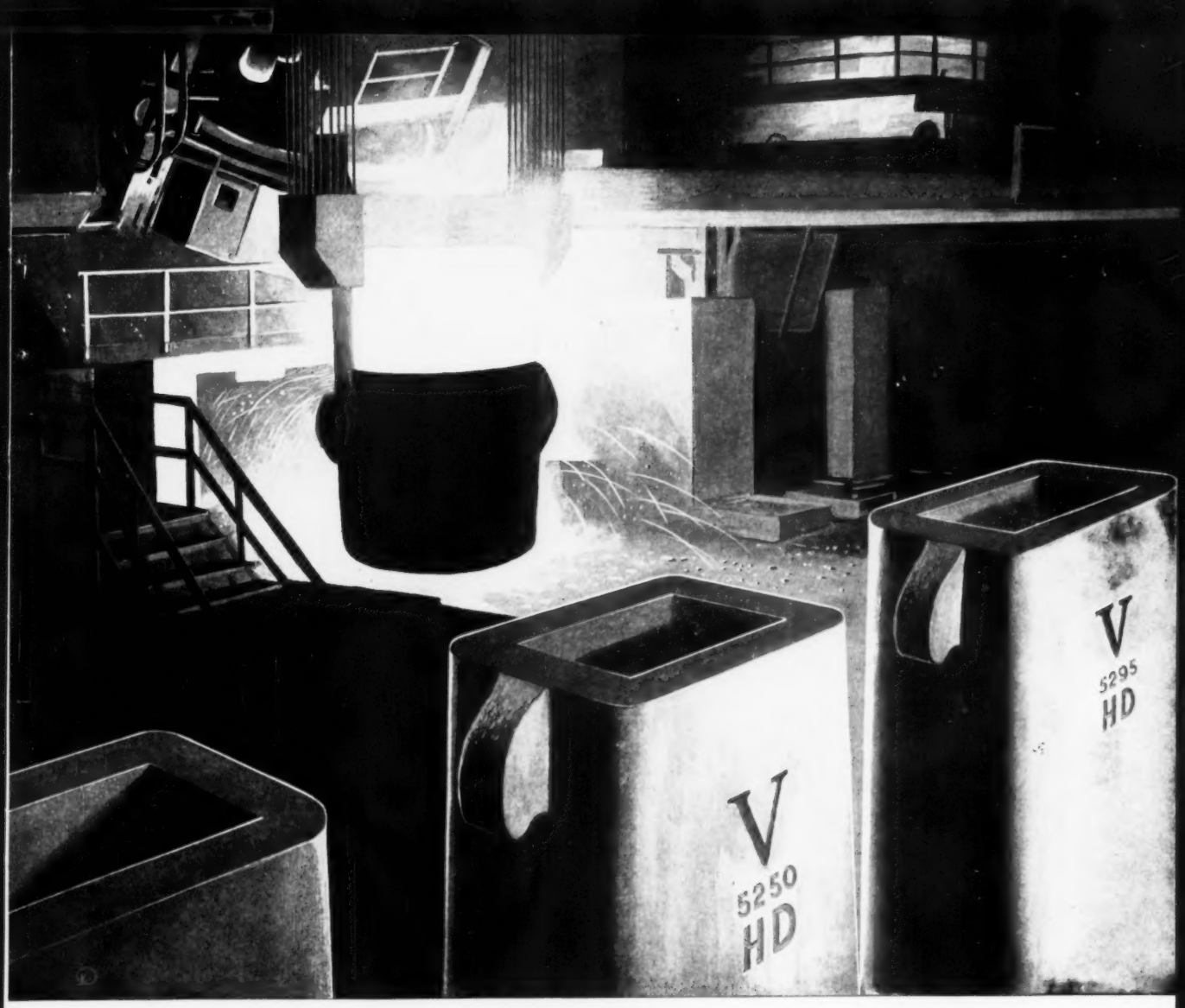
A mandrel, inserted in the tube between the fourth and fifth roll stands, provides a constant inert atmosphere of helium. The inert gas excludes oxygen and nitrogen from the molten metal to get complete penetration of the weld.

The welded tubing passes directly into sizing rolls. The three stands of rolls insure roundness and bring the tube to specified outside diameter. A reduction of 0.060 in. in diameter is normal.

Flying Cut-off—A high speed saw on a traveling carriage cuts the tubing to desired lengths. The saw travels with the tubing as it emerges from the mill.

Hydrostatic testing machine checks each finished tube to pressures of 200 to 1000 psi, depending on wall thickness and order specifications. Testing for weld uniformity is done by cutting frequent test lengths and expanding them over a mandrel where they must withstand an 8-pct expansion without rupture.

Kaiser uses semiautomatic tube stackers to prepare approved tubes for shipment.



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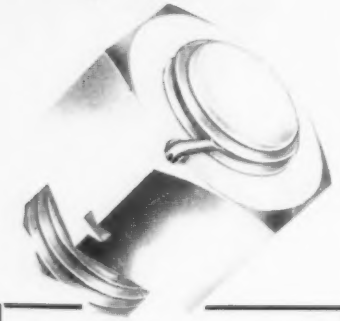

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Here's the self-locking, quickly installed nut that will stay locked even under the severest shock and vibration! Protect your product against these service conditions by specifying ANCO self-locking nuts . . . and add extra value at little cost.

Here's why: The locking pin and the nut form a single unit—the only one-piece standard nut with positive locking action . . . far more effective and practical than mutilated threads or squeezed nuts.

ANCO nuts can be furnished in Black, Cadmium or Galvanized, Aluminum, Brass, Bronze, Stainless Steel, etc.—full range of sizes from ¼" and up in either Coarse or Fine threads to fit standard bolts.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 113.

Micrometers

Micrometer calipers are described in a folder. These tools come either with or without a clamp ring in both plain and ratchet stop styles. (Brown & Sharpe Mfg. Co.)

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Power Transmitters

Power transmission equipment is described in a 12-page color booklet. (Clark Equipment Co.)

For free copy circle No. 2 on postcard, p. 113

Decimals, Dates

A combination decimal-fractional equivalent chart and calendar is now available. (Dayton Rogers Mfg. Co.)

For free copy circle No. 3 on postcard, p. 113

Tubing

Tubemanship and commercial and condenser tube are delved into in two publications. (Wolverine Tub Div., Calumet & Hecla, Inc.)

For free copy circle No. 4 on postcard, p. 113

Hose Lines

Water suction and stream hose are described in two catalog sections. The water suction hose section provides operating data and specifications on five types of hose for industrial use. The steam hose section explains operating and specification data on five types of steam hose. (B. F. Goodrich Industrial Products Co.)

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Brakemotors

Direct acting brakemotors are described in a brochure. (Leland Electric Co.)

For free copy circle No. 6 on postcard, p. 113

Precision Balls

Precision balls for practically any requirement and material specification are listed in a firm's catalog. (Hartford Steel Ball Co.)

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Control Valves

Air and hydraulic control valves are covered in a dozen page booklet. (C. B. Hunt & Son, Inc.)

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Propellers

Large-diameter propellers for cooling towers and heat exchangers are illustrated in 4-page bulletin. Cast-aluminum blades permit full interchangeability in any assembly, simplify installation and maintenance. (Aerovent Fan Co., Inc.)

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Electroplating

Nine ways to improve electroplating are suggested in a booklet. In 12 pages, it points out: (1) proper surface preparation is the starting point for obtaining better

finishes; (2) select the proper compound; (3) rules of thumb for determining solution life; (4) use of titrations; (5) how to avoid unnecessary contamination of solutions; (6) tips on thorough rinsing; and (7) pointers on proper racking. (The Diversey Corp.)

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Heat Treating

Modern gas chemistry and its ability to upgrade and protect metals in quality heat treating is outlined in an 8-page publication. (Surface Combustion Corp.)

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Overhead Conveyors

Overhead conveyor systems, both free and powered, are described in a folder. (Chainveyor Corp.)

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Quick-release Pins

Single-acting self-locking quick-release pins are detailed in a folder. It contains information on materials, finishes, head styles, dimensions and load factors. (Aviation Developments Inc.)

For free copy circle No. 13 on postcard, p. 113

Industrial Trucks

Industrial trucks appear in a 12-page bulletin. It also pictures special attachments. (Baker-Raulang Co.)

For free copy circle No. 14 on postcard, p. 113

Saw Chains

Sharpening instructions for saw chains appear in a bulletin. It shows, step-by-step, how to obtain professional saw filing results by using the proper tools. (Atkins Saw Division, Borg-Warner Corp.)

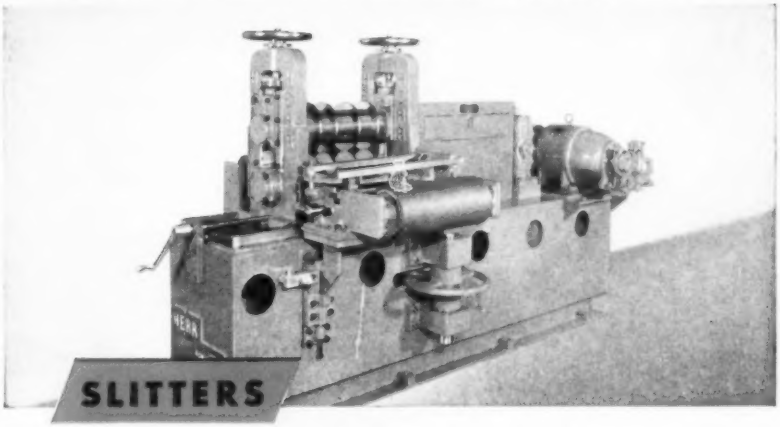
For free copy circle No. 15 on postcard, p. 113

Fastening Problems

Fastening assembly problems are tackled almost daily by one manufacturer. A bulletin gives data on several products that provide answers to these. They include: (1)

HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



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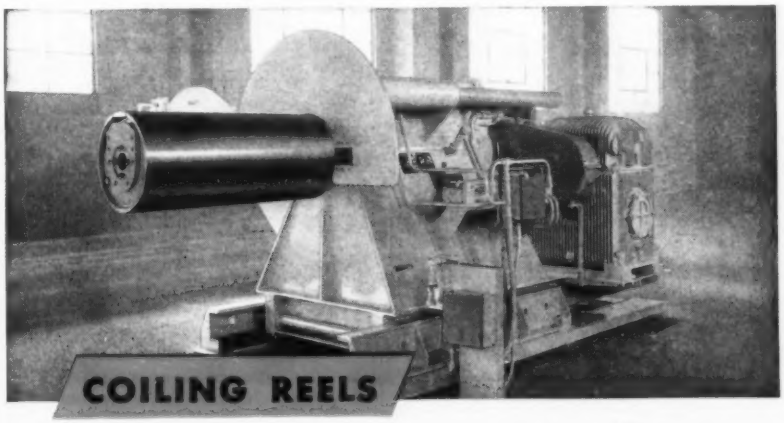

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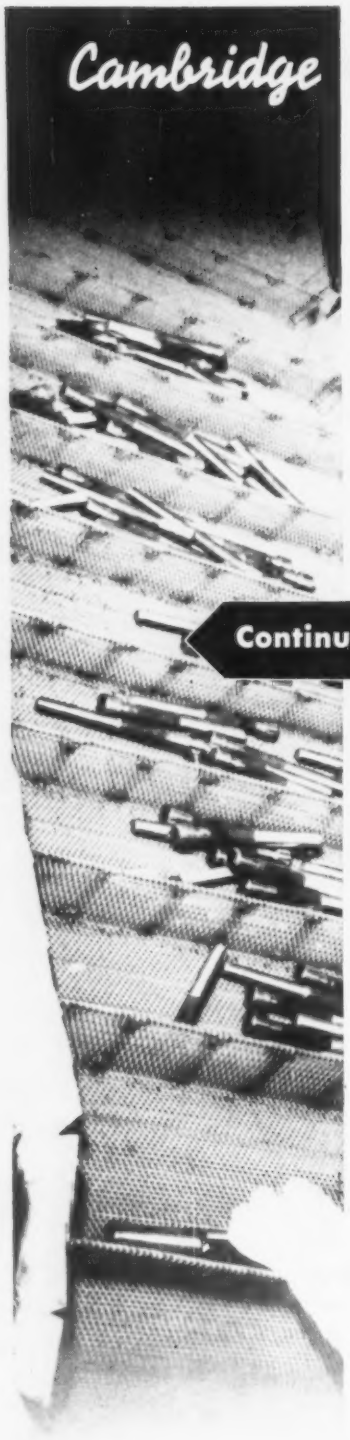


Cambridge **WOVEN WIRE BELTS give you greater production capacity and product uniformity**

Belt-to-belt flow of products through annealing, brazing, sintering, tempering, oiling or quenching operations at a controlled rate of speed increases production and assures uniform treatment of parts. By combining movement with processing, woven wire conveyor belts cut costs, eliminate batch handling, simplify operations. EXAMPLE:

Continuous Heat Treating

ALL METAL BELT moves bolts up and through heat treating cycle at a steady, even rate of speed to assure uniformity of treatment. Special alloys withstand temperatures from sub-zero up to 2100° F.; woven wire construction gives longer life because there are no seams, lacers or fasteners to break.

OPEN MESH permits free circulation of atmosphere around all parts of the load to eliminate hot spots and assure uniform treatment. Open mesh also allows quenching or oiling solutions to drain quickly, thoroughly.

SPECIAL CROSS FLIGHTS and raised edges hold product on belt during flat or inclined travel.

OPTIONAL CHAIN DRIVE provides positive motion for heavy loads or inclined movement. Friction drive easily handles most loads.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to find out how continuous processing on woven wire conveyor belts can give you greater production capacity and uniformity. Look for his telephone number under "Belting, Mechanical" in the *Yellow Pages*. Or, write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

WIRE CLOTH | WOVEN WIRE CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department A, Cambridge 6, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

FREE LITERATURE

bolts or screws with spring lockwashers, multi-toothed washers, special washers or combinations of washers preassembled, free to rotate and function properly but built so as not to come off; (2) thread-cutting fasteners that eliminate tapping operations; (3) nut and lock washer in one combination; (4) snap, bearing, lock and retainer rings; (5) spring lock washers, and more. (Eaton Mfg. Co.)

For free copy circle No. 16 on postcard, p. 113

Locking Screws

Inserts which make screws self-locking, including new miniature ones, are described in an 8-page bulletin. It includes selection tables with thread sizes, insert numbers and sizes, and complete information on drilling, tapping, gaging and installation. (Heli-Coil Corp.)

For free copy circle No. 17 on postcard, p. 113

Thermowells

Industrial thermowells for protecting temperature sensing elements against mechanical injury, and corrosive or contaminating atmospheres are covered in a brochure. (Thermo Electric Co., Inc.)

For free copy circle No. 18 on postcard, p. 113

Connectors

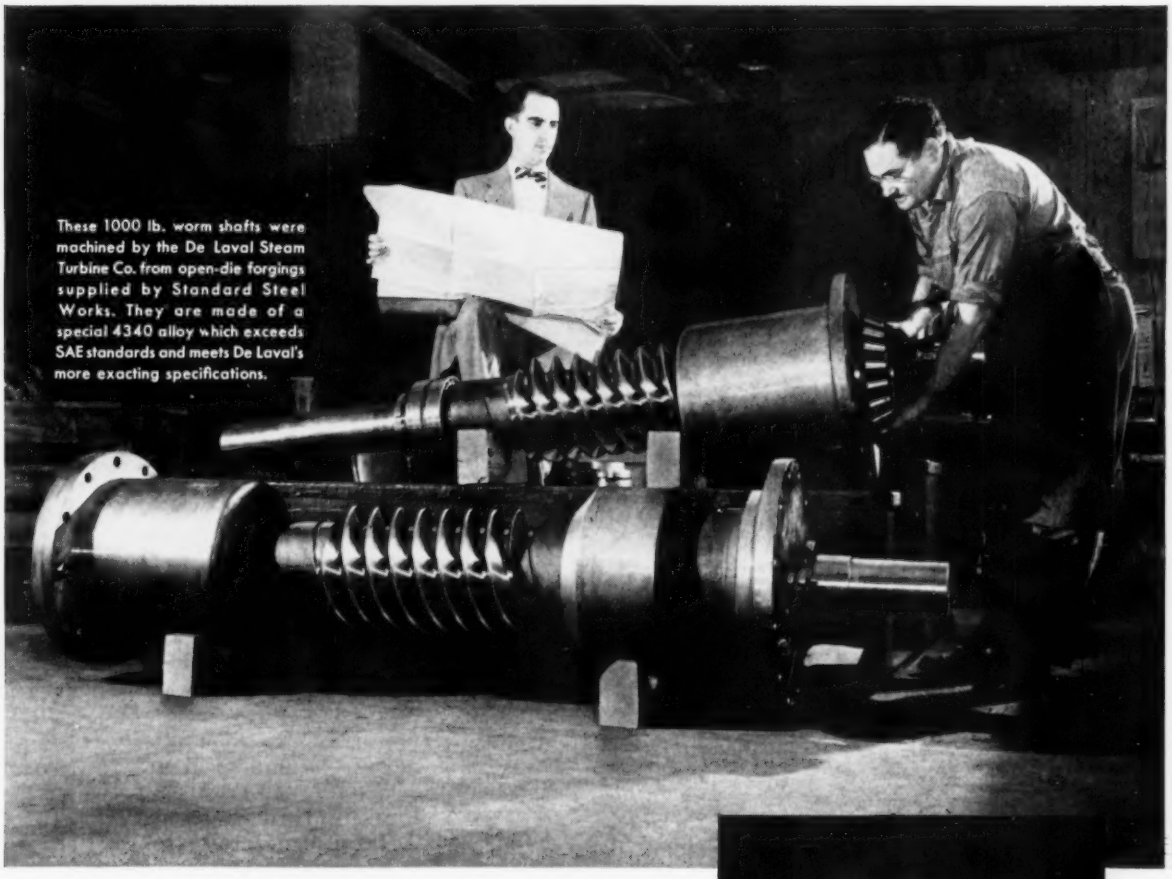
Binding posts are now offered in five colors—white, red, yellow, green and black. They combine utility and beauty for easy circuit and polarity identification and more attractive panels. A 4-page bulletin describes them. (The Superior Electric Co.)

For free copy circle No. 19 on postcard, p. 113

Turbine-Generators

Eddy-current losses and internal temperatures in large hydrogen-cooled turbine generators are reduced through use of a 540-degree transposition in the stator coils. A paper describes the reduction. (Allis-Chalmers Mfg., Co.)

For free copy circle No. 20 on postcard, p. 113



These 1000 lb. worm shafts were machined by the De Laval Steam Turbine Co. from open-die forgings supplied by Standard Steel Works. They are made of a special 4340 alloy which exceeds SAE standards and meets De Laval's more exacting specifications.

"It used to take us 12 weeks to get the required forgings for these worm shafts. We now get them in 6 weeks —from Standard Steel Works"

We accommodate De Laval's Mr. Schwarz in two ways so as to give him the service he wants: (1) We keep ingots and billets of the special high quality steel De Laval demands on order point—we can meet even the largest requirements on short notice; (2) each forging is tested and inspected—the product of complete and precise quality control. Mr. Schwarz knows he can expect not only service, but also quality when he orders forgings and castings from us.

Mr. Schwarz is just one of many industrial executives who have been impressed with the extra *service* we enjoy rendering. Not a month goes by that De Laval doesn't come to us with some special request which we can meet, and cheerfully. And hardly a day goes by that one of our many customers doesn't put our boast of personalized service to the test. Why don't you let us handle your next forging or casting requirement. You'll appreciate our service as well as our know-how. Write Dept. I-F.

"It's not unusual for me to be invited out on the floor to talk with the men who are actually making castings and forgings for us. In my opinion it's the personal interest which the men at Standard take in a customer's order that lies behind the consistently excellent service they render," *says E. T. Schwarz, Director of Purchasing, De Laval Steam Turbine Co., Trenton, N.J.*

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

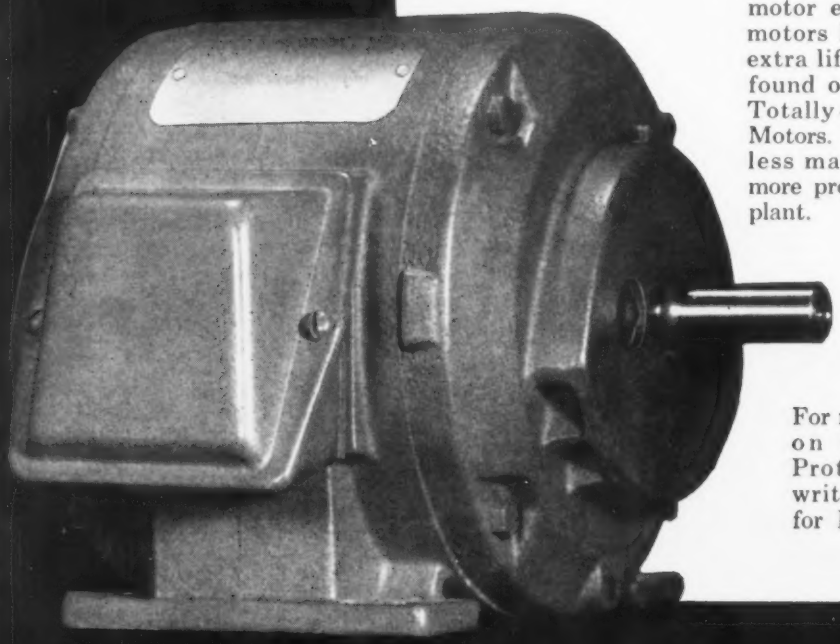
the world's only

TOTALLY-PROTECTED MOTOR

When we speak of Totally-Protected, we mean superior frame design with rigidity for heavy load conditions. We mean Metermatic bearing lubrication, acid and oil-proof insulation system, and motor leads, labeled and sealed in neoprene.

Totally-Protected means all this and more, but most of all it means a new concept of motor design and construction.

This Totally-Protected concept brings you a new motor efficiency. These motors have a built-in extra life—an extra life found only in Reliance Totally-Protected A-c. Motors. You profit from less maintenance and more production in your plant.



For more information on this Totally-Protected concept, write to Dept. 26A for Bulletin B-2401.

(B 1843)

RELIANCE R ELECTRIC

AND ENGINEERING COMPANY

CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONT.

Sales Offices and Distributors in Principal Cities

PROBLEM:

How to get extra wear resistance high core strength and good toughness in impact mechanism of new power hammer

SOLUTION: Nickel alloy steel—Carburize!

The parts shown in section above are the heart of the impact mechanism of Ingersoll-Rand's new lightweight electric power hammer.

They're made of 8640, a nickel alloy steel. By carburizing the parts, I-R gets a surface with extra wear resistance while retaining the very high strength of the fully hardened core to take the impact and stress of 2300 blows a minute.

Piston, crosshead and both outer and inner spring seats are made this way. They can withstand terrific, continuous pounding and shock load *with a minimum of wear . . . without deforming or cracking.*

Your requirements may be altogether different from Ingersoll-Rand's. But when you need a metal with the "extra" properties there's a grade of nickel alloy steel to cover practically every fabricating or service demand.

Send us details of your application and we'll be happy to help you.

New electric power hammer by Ingersoll-Rand, New York, N. Y., can be used for breaking concrete (above), stone, macadam . . . for drilling, roughing, cleaning, caulking, scaling, chipping, seaming and dozens of other jobs. Unit weighs only 12 lbs. and features an exclusive "spring floating" piston.

INCO TRADE MARK

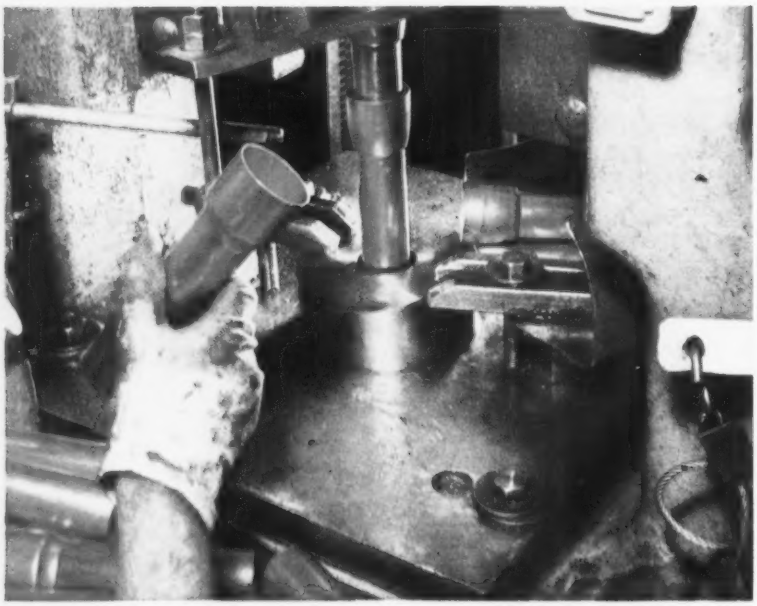
THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

Steel's Strength, Copper's Fluidity (sealing ability) and corrosion resistance all are combined in Sterling Automotive Mfg. Co.'s use of Thomas copper-coated steel strip. By lubricating dies during punch press forming, copper coating boosted die life by 33%. The Chicago company turned to Thomas electro-coated strip to give its auto head gaskets extra strength needed for today's high-compression engines.

20 Million Shoe Horns a Year are made in Crawfordsville, Ind., plant of Steel Industries, Inc., where Thomas Strip saves up to 40% of production cost. From nickel-coated Thomas Strip, shoe horns get bright, shiny finish with only ball-burnishing after forming.

New Ways To Cut Costs With Thomas Strip

How Six Manufacturers Use These Production Ideas For Better Products



Ray-O-Vac Company saves $100,000 a year at its Clinton, Mass., Flashlight Division, by using Thomas copper-coated strip for flashlight cases. Compared to brass, Thomas deep-drawing strip is fabricated faster, requires less processing — also, copper coating lubricates dies and provides good chrome-plating base.

Manufacturers pictured on these pages chose Thomas Strip because it cuts costs, improves products—gives them higher profits and increased sales.

Pre-coated Thomas Strip is furnished ready for use with electro-plated coatings of zinc, copper, brass, nickel, or chrome . . . or hot dip coated with lead alloy or tin . . . and coated with clear or colored lacquer.

Uncoated Thomas Strip products include low carbon, alloy and high carbon spring steel grades. All are available in a wide range of sizes, gages, tempers and finishes.

You also can get cold rolled Thomas Strip plain or coated with a rolled-in pattern design of your choice.

All Thomas Strip products can save you money and enhance your product in six important ways:

- **Fabricates Easily**—coated steels stand fully as much fabrication as uncoated strip.

Increased Saleability and Profits followed Pioneer Can Co.'s switch from lithographed tin plate to brass-coated Thomas Strip with a rolled-in pattern design. Pioneer's waste baskets and decorative cans gained in durability, beauty and re-use value. They command a higher price now and return more profits.

General Electric's styling of its deluxe range made at Appliance Park calls for liberal use of pattern-rolled Thomas Strip. Deeply rolled rib design, satin chrome-coated, is used on oven door—adds distinctive modern touch to GE's Keyboard Ranges. Thomas offers many design patterns in plain or coated steels.

- **Longer Die Life**—most coatings lubricate dies, reduce wear and increase tool life.
- **Maximum Pieces Per Pound**—precision rolling to extremely close size tolerances gives more square feet of strip per ton.
- **Lower Plating Costs**—coatings can serve as final product finish or as base for further plating or painting.
- **Speeds Fabrication**—Thomas Strip coatings eliminate costly intermediate fabricating steps such as cleaning, buffing, even plating.
- **Steel's Strength and Economy**—are combined with beauty and utility of more expensive metals.

All the savings and benefits Thomas Strip specialties are giving to fabricators shown here are available to you. A national sales staff—familar with design and fabrication advantages of Thomas Strip is ready to serve you.

Write for samples, and additional cases of users' actual experiences with Thomas Strip Products. Do it today.

Stack 'n Add is another new product of Quaker Industries, Kenosha, Wisc. The smart sectional shelving gets strength, beauty and economy through use of Thomas brass-coated, buffed and lacquered strip for upright supports. Electro-coated Thomas Strip eliminates expensive pre-forming preparation, as well as costly plating.

Thomas Strip®

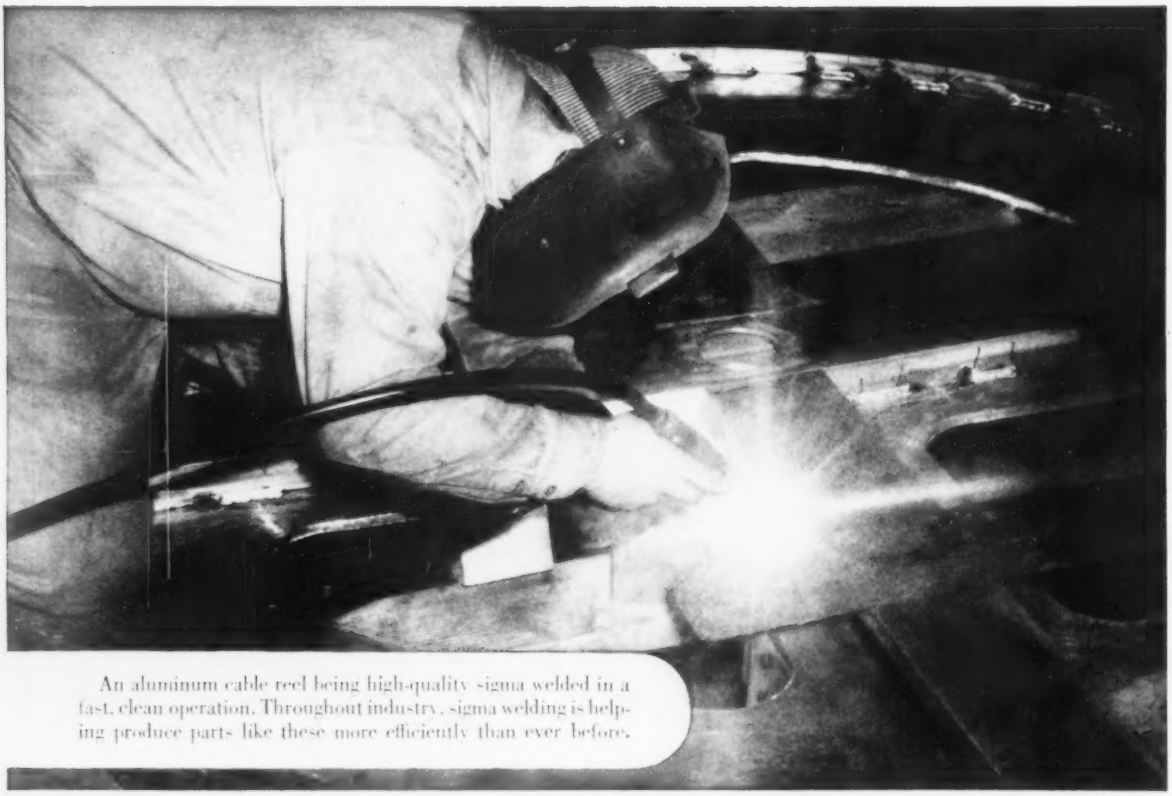
Division

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pennsylvania

District Sales Offices:

Atlanta	Columbus	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio
Cleveland	Dayton	Los Angeles	Pittsburgh	



An aluminum cable reel being high-quality sigma welded in a fast, clean operation. Throughout industry, sigma welding is helping produce parts like these more efficiently than ever before.

SAVED-50% of fabricating cost...

by using

SIGMA WELDING

Sigma welding's combination of automatic wire feed, and dependable argon gas-shielding accounts for the fifty per cent cost saving made in fabricating aluminum cable reels like the one shown above. Top quality welds are made in these $\frac{1}{4}$ and $\frac{1}{2}$ inch thick aluminum parts at speeds up to 20 inches per minute—and no post weld treatment is necessary.

The Ease of Handling gained by automatic wire feed both simplifies and speeds welding operations. A shield of inert argon gas envelopes and protects the weld puddle from harmful effects of the atmosphere, and eliminates need for flux.

Sigma Welding Is Ideal for a Wide Range of Jobs because it joins all commercially fabricated metals, and can attain full penetration up to $\frac{1}{4}$ inch in a single pass. A complete line of portable manual, and automatic mechanized apparatus is available—and all are easy to operate and maintain.

For more information on sigma welding, or on any of LINDE's modern methods of joining metals, call your local LINDE representative—or write for free illustrated literature. Start saving now, do it today.

LINDE COMPANY
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30 East 42nd Street, New York 17, New York
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FREE LITERATURE

This section starts on Page 108

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Carbide Tools

In 32-pages, a catalog lists a firm's line of tungsten carbide tools, tool tips, dies, wear parts, a mechanical toolholder and sintered aluminum oxide products. (Adams Carbide Corp.)

For free copy circle No. 21 on postcard

Engine Stop Valve

A cushioned automatic engine stop valve is introduced in an 8-page bulletin. This combined throttle and automatic engine stop valve automatically shuts down a turbine, compressor, or engine in the event of overspeed or runaway. (Golden-Anderson Valve Specialty Co.)

For free copy circle No. 22 on postcard

Broaching Tips

Want some really good tips on how to care for broaching tools? Well, a 24-page booklet offers about 50 of them. Some are well-known recommendations, some not. (The Lapointe Machine Tool Co.)

For free copy circle No. 23 on postcard

Closed-circuit TV

Closed-circuit television and its many applications are discussed in a publication. It offers a clear, brief review of the whole idea of industrial video. (Industrial Electronics Div., General Electric Co.)

For free copy circle No. 24 on postcard

Exothermic Products

Exothermic products, including liquidizers and fluxes for all metals and alloys, are covered in an 8-page bulletin. It presents data on: (1) a carbon free liquidizer for replacing common carbonaceous "head compounds" or "pipe eliminators" used to control shrinkage in the production of ingots and castings; (2) a liquidizer for use with aluminum; it has a low ignition point; (3) a "short head compound" for iron and steel castings having a head ratio of one-half to one or less; and (5) a thermotomic compound for feeding heads and risers. (Pittsburgh Metals Purifying Co., Inc.)

For free copy circle No. 25 on postcard

Aluminum Partitions

Aluminum partitions of standard extruded shapes are covered in a company's literature. The maintenance-free enclosures erect easily. Principal extrusions are 2 x 2-in. square tube for the vertical members and rectangular tubes or channels for the horizontal sections. (Harvey Aluminum.)

For free copy circle No. 26 on postcard

Steel Strappers

Round steel strapping machines are illustrated on a unique mailing sales promotion folder. It pictures a floor-model unit for strapping many items. (Gerrard Steel Strapping Div., United States Steel Corp.)

For free copy circle No. 27 on postcard

Gearmotors

Right angle gearmotors get reviewed in a brochure. It describes foot-mounted and shaft-mounted models. (Sterling Electric Motors.)

For free copy circle No. 28 on postcard

Specialty Strip

Spring and specialty strip steels available from one firm are described in a folder. It describes the supplier's quality and service facilities. (Sandvik Steel, Inc.)

For free copy circle No. 29 on postcard

Differential Switch

A firm's written matter presents a differential switch for vacuum and low pressure applications. It has a

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **6/20/57**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on product advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

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Company

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FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

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FREE LITERATURE

metal diaphragm and comes in two classes for sensing pressure differences from 15-in. of water below atmospheric pressure to 80-in. of water above. (Barksdale Valves Pressure Switch Div.)

For free copy circle No. 30 on postcard

Tubular Parts

Special metal tubular parts, 0.010 to ⅝-in. diam ± 0.001-in., are described in a bulletin. (H & H Machine Co., Inc.)

For free copy circle No. 31 on postcard

Fittings

Corrosion-resistant fittings are the subjects of a 22-page booklet. It lists three advantages for these fittings: (1) low installation cost, (2) high flexibility, and (3) very good flow conditions. (Horace T. Potts Co.)

For free copy circle No. 32 on postcard

Metal Spinning

Metal spinning is discussed in a booklet. Pointing out that this "revolutionary new" process has actually been around for centuries —in principle, it goes on to give a very good review of the subject. Major advantage of spinning: no scrap worries; in fact, no scrap. (Phoenix Products Co.)

For free copy circle No. 33 on postcard

Coolants

Oil base additives, which dilute with mineral oil to form metal cutting oils, are outlined in an 8-page booklet. These concentrates include general-purpose, non-corrosive and heavy-duty materials. (Cincinnati Milling Products Div., Cincinnati Milling Machine Co.)

For free copy circle No. 34 on postcard

Steel Tubing

Tolerances for steel tubing and pipe available from one company are given in a data chart. It covers tolerances for seamless and welded mechanical tubing, and seamless and welded seamless steel tubing and pipe. The chart details each tolerance and gives permissible variations in OD, ID, wall, ovality and straightness. (Peter A. Frasse & Co., Inc.)

For free copy circle No. 35 on postcard

Engineered Systems

A 16-page brochure describes a number of engineered and automated handling systems. Materials handling equipment for bulk and unit materials, automated and special handling machinery and foundry equipment are illustrated. So also is firm's creative engineering service. (Planet Corp.)

For free copy circle No. 36 on postcard

Belt Conveyor

Portable belt conveyors are reviewed in a bulletin. It details features and advantages of an aluminum handler with an incline hydraulically adjustable to desired angles by finger-touch operation. (The E. W. Buschman Co.)

For free copy circle No. 37 on postcard

Reclaiming Machines

New life for old machines is the subject of a booklet. (Caterpillar Tractor Co.)

For free copy circle No. 38 on postcard

Leaded Steels

Late information on basic characteristics, mechanical properties and workability of leaded steels is contained in a 16-page booklet. Test results are supported by complete data and charts. (Copperweld Steel Co.)

For free copy circle No. 39 on postcard

Temperature Controls

Information on a current-adjusting type control system for growing large, single germanium or silicon crystals is available in a 4-page data sheet. (Leeds & Northrup Co.)

For free copy circle No. 40 on postcard

NEW

KAYDON THIN SHELL NEEDLE BEARINGS

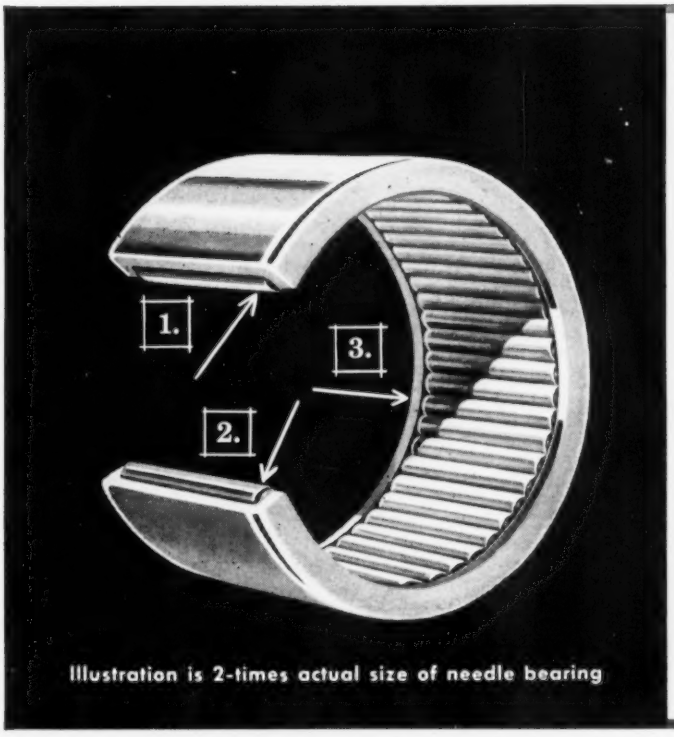
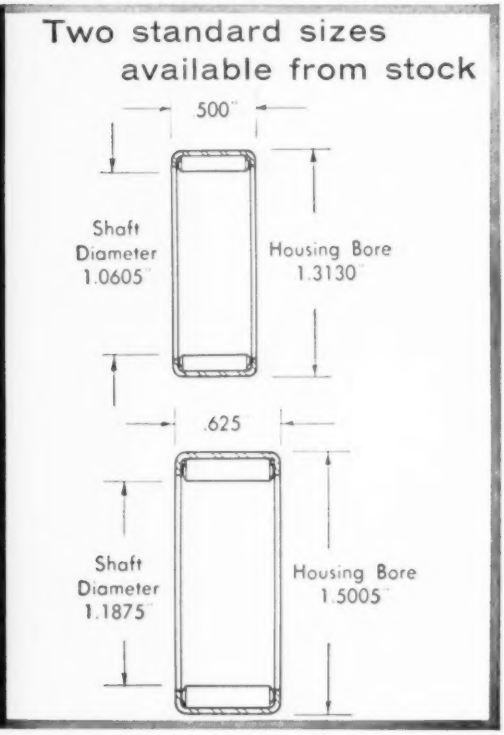


Illustration is 2-times actual size of needle bearing



You get these Kaydon design advantages:

1. Greater effective length needle rollers for MORE CAPACITY (41% on ½" width) . . . LONGER LIFE (2.8 times as much on ½" width) 2. Simplified construction that SAVES you money 3. Pre-packed lubrication that SAVES assembly time.

These new thin-shell bearings were developed with the co-operation of the FORD MOTOR COMPANY for use in FORD-O-MATIC and MERC-O-MATIC automatic transmissions

Kaydon's new thin-shell needle bearing gives more of everything — *more economy . . . more capacity . . . plus longer life* than any other comparable bearing. That's because of Kaydon's greater effective length of spherical end rollers.

This new bearing is ready for you right now from stock in two standard sizes (illustrated). Other sizes will be available later.

For complete specifications, ask for Data Sheet No. K562 — write, call or wire Kaydon of Muskegon.

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

All types of ball and roller bearings — 4" inside diameter to 124" outside diameter . . . Taper Roller • Roller Thrust • Roller Radial • Bi-Angular Roller • Spherical Roller • Needle Roller • Ball Radial • Ball Thrust Bearings

YOU CAN SAVE TIME, TROUBLE AND COSTS with

Formed Tubes...

★ **Save Time**

We have a huge stock of dies and, when needed, tooling's fast. We also avoid delays by making our own electrically welded steel tubing, sizes from 5/8" to 3" OD.

★ **Save Trouble**

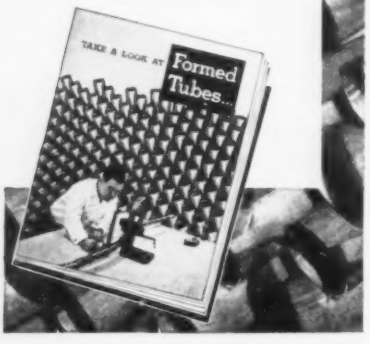
Long, active experience with all tube forming processes and high standards of quality control make sure your orders will be completed *right.*

★ **Save Costs**

It's routine for formed tubes parts to deliver top performance, save weight, cut costs. Steel, copper, brass, aluminum or stainless tubing fabricated in 3/8" OD to 6" OD sizes; from 20 to 11 ga. metal.

Formed Tubes, Inc.
606 Prairie, Sturgis, Michigan

Write for FREE Booklet



Works Two Parts At Same Time

An automated unit that drills, chamfers and taps a part at 28 different stations might be noteworthy.

Here's a machine, though, that automatically works not one, but two different parts.

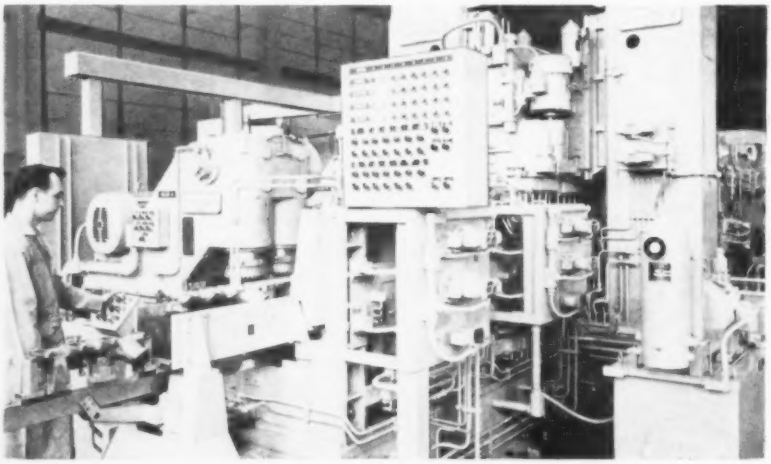
▪ How flexible can an automated machine tool get? The answer is: pretty flexible. An example of this is a special machine tool now in operation at a large auto parts plant.

The segmented in-line transfer machine mills, drills, chamfers and taps two different automotive engine exhaust manifolds. It does these at a 136 per hour clip. Built-in sensing devices in the 28-station, 63-ft long unit permits the two different parts to be processed through the operations at random.

Milling Leads Off — The joint faces of the two manifolds are identical. So milling, drilling and tapping operations on these areas come first. Additional clamping support is necessary for drilling, chamfering and tapping one of the manifolds. Sensing devices spot this part; these detect it by sensing its cast surface. This causes a hydraulically operated clamp to engage the part.

The next operations follow automatic turning-over of the parts by a rotating fixture. These subsequent milling, drilling, chamfering and tapping operations are not common to both parts. One is processed through these operations and passes the balance of the machine with the stations automatically idled by sensing instruments. These detect one part from another all along the line by searching for the cast surface.

Intercept Number Two — The second part has idle stations through the first operations. However, upon reaching the last stations the machine "comes alive" and begins working the piece.



TAKES TWO: This segmented, in-line transfer machine processes two different automotive parts simultaneously.

Probing stations await the parts at four stations. These decide whether the work will be machined or not. They also check all the holes and automatically shut down the entire unit if they spot any incomplete holes or broken taps.

Built by Snyder Tool & Engineering Co., Detroit, the setup includes several of the maker's standard type machines with hardened and ground ways. Seven way-type units and eight self-contained ones are used. Tapping head spindles have individual lead screw drives.

A Disassembly Line; And It's Automated

Assembly lines are well-known, generally mechanized systems—and there's a trend to automating them further. However, disassembly lines are a little less known—and it's been only recently that any attempt has been made at automation of these.

Such lines are usually set-up for repair and overhauling of worn-out or well-used items. At the beginning of the line, repairmen place a complete finished product. As it moves along, machines take it apart. Finally, there's nothing or little left; then it's time for the assembly line to enter the picture and reverse the procedure.

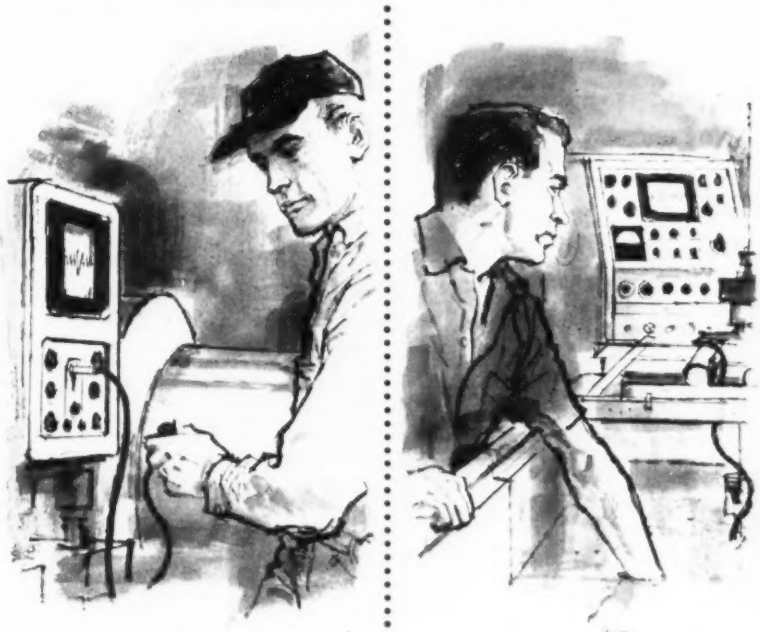
Dismantles Automatically—One important disassembly line application is in the aircraft industry. Here, plane engines in need of repair are automatically stripped down.

Speaking before an American Society of Mechanical Engineers gathering in New York, E. W. Denison of General Electric Co.'s aircraft gas turbine division, described

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

ULTRASONIC TESTING–



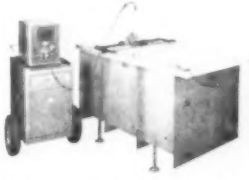
CONTACT or IMMERSION?

Either way, you're served best by the Sperry Reflectoscope

Both ultrasonic immersion and contact testing serve flawless purposes... the type to use is the one that serves your operation most effectively. The *equipment* to use to inspect your material or product for internal flaws is something we know a lot about.

The Sperry Ultrasonic Reflectoscope is admirably suited to *either* type inspection whether "tank" or "touch"... it can be used for one or the other with equally efficient results. Thus, you're not limited to one kind of testing. With the same basic equipment you could perform both immersion and contact testing if your operation required it. Or, whenever it was necessary, you could switch from one type of testing to the other. The Sperry Reflectoscope's "dual adaptability" makes it easy.

In manufacturing the Sperry Reflectoscope for both immersion and contact testing, we have acquired considerable experience in determining which type of testing is best suited to a given manufacturing operation. Should you require any assistance in this direction, we'll be only too glad to help you.



Complete Immersion Testing Systems, available at low cost, ready to use in the production line and laboratory. Call or write for specifications and descriptive literature.

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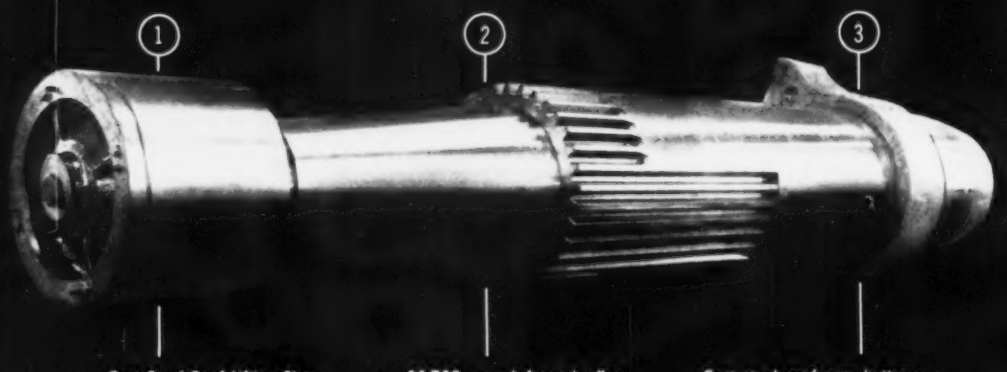
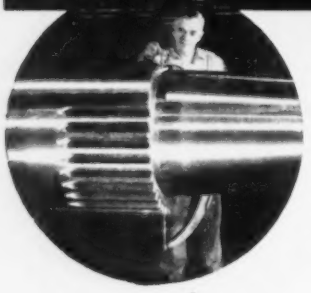
ERIE FORGE & STEEL!

Complete Forged and Cast Steel Assembly
for Electric Furnace Roof Lifting Ram . . .

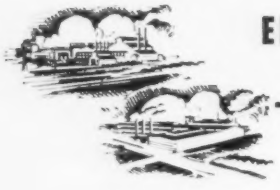


1. Cast Steel Roof Lifting Piston Head Gland Ring and Cap Assembly 2990 pounds.
2. 55,700 pound forged alloy steel Roof Lifting Ram.
3. Cast steel roof ram buttress 3880 pounds.



This roof lifting ram used by a leading builder of electric melting furnaces was manufactured and assembled complete by Erie Forge & Steel Corporation. The steel castings were poured in our own steel foundries. The steel for the forging was made and forged in our own shops. These components were machined, keyways finished, and the whole assembled within our own plants here in Erie.

Close metallurgical control of every step in foundries and forge shops results in unquestioned quality. Careful supervision in machine shops and final assembly . . . these *routine* procedures give practical meaning to our often repeated, "Here your steel castings and forgings are followed closely from raw materials to finished product under 'One Responsibility and One Control'". Place your component parts requirements with us, fully confident of the results you expect.



ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

how the automatic assembly - in - reverse technique works. He points out that it speeds repair jobs and reduces the cost of aircraft maintenance.

A Step Further—Carrying the idea a step further, another speaker called for the construction of special trouble - shooting machines which would enable mechanics to find out what is wrong with an engine without removing it from the aircraft.

L. A. Wilson of the U. S. Navy Bureau of Aeronautics emphasized that automation may well be the answer to many maintenance worries. But, he points out that its application "will require radical changes in our thinking and our methods of operation."

Shop-made Rope Tester Makes Plant Safer

When rope slings snap under load, accident rates and plant costs go up. Materials or work carried by the failing slings can fall on the floor, bruising or smashing the item. If it drops onto an expensive piece of equipment it can sometimes cause serious damage. Most of all, though, is the human factor. Unsafe ropes can mean employee injuries.

To detect and eliminate weakened rope slings before they fail under load, engineers at Calumet & Hecla's Wolverine Tube Div., Detroit, designed and built a simple, rugged, mobile rope tester out of spare parts.

Rope A Must — The firm, a major producer of copper, brass and other types of tubing, uses approximately 5000 rope slings in 6- and 8-ft lengths to handle unit loads of tubes in process. Rope slings are desirable because they do not mar the surface of tubing.

The framework of the tester consists of an 18-ft long H-beam supported by four braced angle-iron

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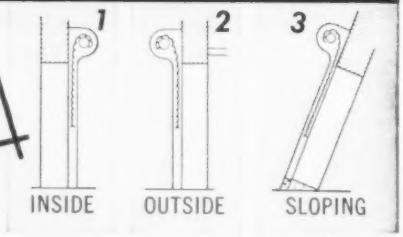
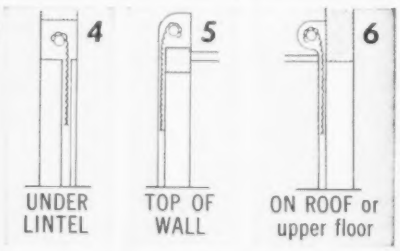
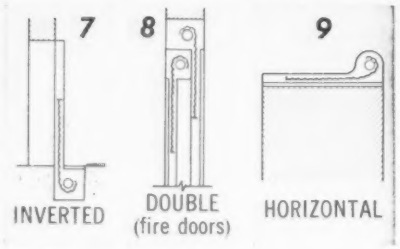
Quick Guide to Kinnear Door Versatility



Kinnear Steel Rolling Doors

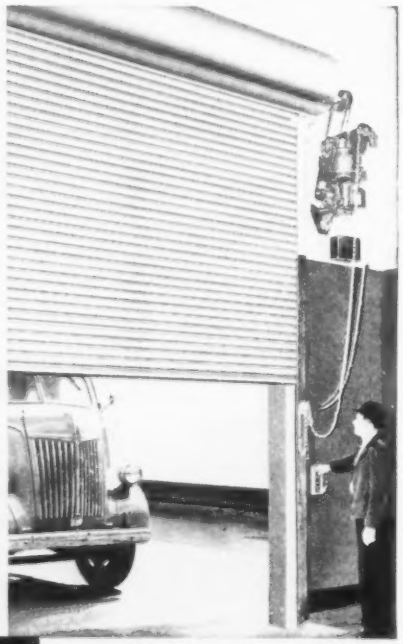




Whether your door needs are standard or special, Kinnear Rolling Doors offer you more efficiency *more different ways* than any other type of door. For example, the coiling upward action of Kinnear's interlocking steel curtain can be applied:

1. Mounted on inside wall; coils overhead.
2. On outside wall; leaves ceiling clear.
3. Sloping doorway (chutes, hoppers, etc.).
4. Hood under lintel or concealed in wall.
5. Hood above lintel or on top of wall.
6. Hood above roof or upper floor level.
7. Inverted mounting (coil below door sill).
8. Kinnear Rolling Doors (automatic fire type) on both sides of wall for maximum fire protection.
9. Horizontal mounting (openings for observatory, ventilator or similar eqpt.).

In *every* installation, Kinnear Rolling Doors open *out of the way* . . . need no usable space for either storage or operation . . . give extra protection against fire, theft, wind, weather or vandalism. Extra heavy galvanizing assures corrosion-free durability. Built any size. Motor or manual operation. Write for full information!



KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.
FACTORIES:
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1742 Yosemite Ave., San Francisco 24, Calif.
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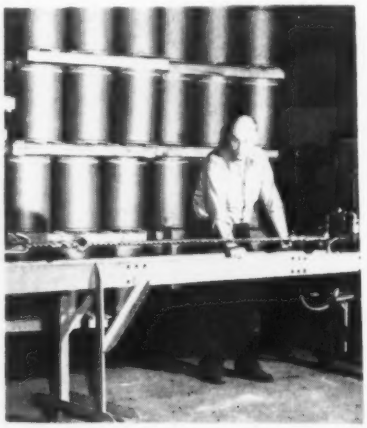
legs welded to the beam's flanges. Each pair of legs is supported on a caster mounted length of U-channel.

Air Cylinder Provides Force—An 8-in. ID air hydraulic cylinder with a 15-in. stroke, taken from a scrapped machine, provides the force for testing the slings. The



An inspector submits a length of rope to a strength test.

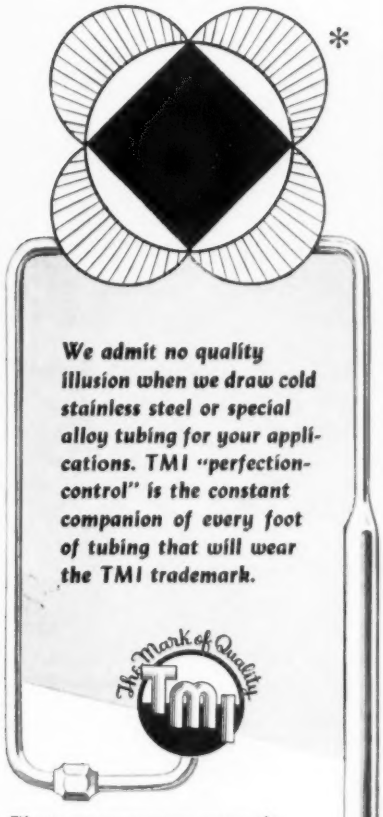
cylinder is bolted to the web of the H-channel, and a hook is mounted on the cylinder plunger. The cylinder hook runs in a groove so that it does not twist as the rope is put under tensile load. A double hook, which can serve for both rope lengths, is mounted at the opposite end of the H-beam.

Air at 80 psi is supplied to the unit; a pressure regulating valve steps it down and maintains a pressure of 38-40 psi to the cylinder. A moisture trap and lubricator are also installed in the compressed air line.

Test Procedure—The test procedure is simple. A rope sling is mounted for testing by slipping the loop ends of the sling over the hooks. The operator then opens the air valve to the cylinder, thereby applying a 2000-lb tensile load on the rope sling. The load is maintained until rope creepage stops. A sling in satisfactory condition will "give" a certain degree and then hold steady. A faulty sling will con-

TMI TUBING

—Built by Perfectionists for Perfectionists!



We admit no quality illusion when we draw cold stainless steel or special alloy tubing for your applications. TMI "perfection-control" is the constant companion of every foot of tubing that will wear the TMI trademark.

Electro-comparators prove the original stock . . . hydrostatic equipment, dye penetrants, tensile, flare, Huey-test and bend-strength instrumentation . . . ultrasonic, X-ray and photo-electric installations "pull out" the merest hint of any tube which does not meet TMI's perfectionist standards.

WITH TMI TUBING in your product you know that quality is a fact as well as a promise. We've been proving it for nearly two decades.

**Don't be fooled by the eye-test . . . the circle around the diamond appears to be flattened. It is really perfectly circular!*

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tinue to creep until breakage occurs.

A testing schedule assures that every rope sling used in the plant is tested once a month. To keep a quantitative record of the tests, a Veeder counter was mounted on the machine. The counter is linked to the air valve so that actuating the valve automatically actuates the counter. The operator records the counter reading when he starts testing a load of slings and the reading when the tests are completed.

Firms Plate Parts, Then Fabricate

Though it might seem like putting the cart before the horse, many metal products manufacturers are reversing the usual procedure of plating a part after fabrication. Instead, they plate, then fabricate.

According to American Nickeloid Co., Peru, Ill., more and more fabricators are switching to pre-plated metals as a design material. Thus, they refute the idea of fabricating the part, then cleaning, plating, polishing and assembling. With pre-plated metals, the part just needs fabricating, then assembling.

Other Steps Gone—Cleaning, post-plating and polishing are eliminated. This results in few rejects, and according to the firm, low production costs.

Despite their finish, the pre-plated raw material readily adapts to standard production techniques. Usually, it requires no special tooling or handling.

Nickeloid metals come in sheet, coil or strip; base metals of steel, zinc, copper, brass or aluminum; finishes of chrome, nickel, copper or brass.

Silver Clad Bronze

Silver is an excellent conductor of electricity; phosphor bronze has outstanding spring properties. But suppose you want the advantages of both? The answer is simple: combine them.

Actually, the answer is not quite so simple. Yet it's exactly what

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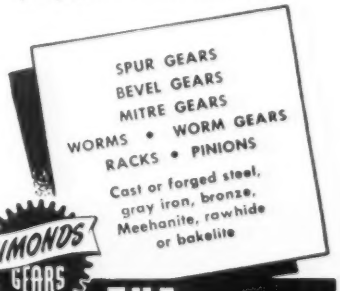


THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA.

Quality Gears for over 60 years

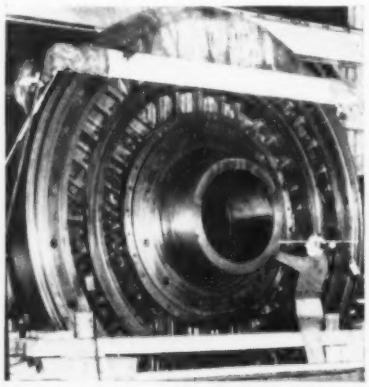
producers at American Silver Co., Flushing, N.Y., are doing. Thanks to a new process, the firm now turns out a new type silver clad phosphor bronze strip. They clad the overlay of silver to the phosphor bronze while eliminating the use of brazing alloys containing zinc, cadmium or other low vapor-pressure metals. The material is for use in electronic tubes where such vapors are intolerable.

The strip comes in thickness tolerances of ± 0.0001-in. to mill limits as low as 0.0005-in. thick. The ratio of silver to bronze is variable according to requirements.

Shaves Big Gears

Slated to finish turbine gears for shipbuilders is a large vertical gear shaver. The new machine tool, currently under construction at Michigan Tool Co., is a 200-in. capacity unit.

Part of the machine tool, a 29-ton worktable, recently was delivered to the company's plant in Detroit. The table, when integrated into the unit, will be part of a finishing machine that will work main turbine gears for use in new naval and commercial shipbuilding programs.



This 29-ton worktable will be part of a giant gear shaver.

Adhesive Bonding Ups Oven Use

In the field of metal joining, laminate bonding with adhesives is taking its place alongside the older stand-by methods. Although relatively new, this joining process is now being used successfully by automotive and aircraft firms, plus other manufacturers, in scores of different bonding applications.

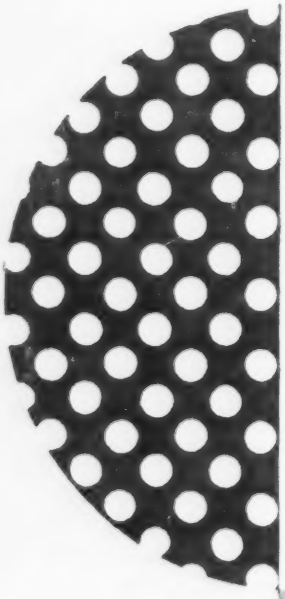
Some companies use laminate bonding to join dissimilar metals. Others find it a highly practical methods of joining metals to nonmetals including glass, plastics, wood and ceramics.

Oven Use Growing—Closely paralleling the growing use of adhesives to solve difficult bonding problems is the increased use of radiant ovens. These dry adhesives prior to bonding various materials into a "sandwich" and passing them through a pinch roll.

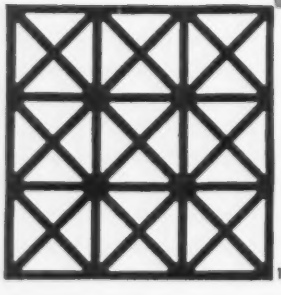
In some industries, the use of radiant ovens enables manufacturers to bond laminates on an assem-

count on **WISSCO**

for every type of perforation



- All metals including stainless and carbon steel, monel, copper, brass, bronze and aluminum.
- Fabricating facilities include rolling, forming, shearing, welding and assembling.
- Material to be perforated can be supplied either by us or by your company.



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Modern high-speed precision drawing and stamping operations require only the highest quality steel if top production - low reject rates are to be maintained on difficult-to-run parts. And the highest quality steel produced anywhere is Youngstown Sheets and Strip.

Our satisfied customers, across the nation, tell us time and time again: "Our production is increasing—Rejects falling off—Fabrication costs are down." Why not make Youngstown your regular sheet and strip specification from now on—for improving both product quality and the overall profit picture.

When you use Youngstown Sheets and Strip you can be sure metallurgical quality will never vary because they are produced by steelmakers—with over 56 years experience—using only the most scientific quality control techniques. This guarantees a proper blending of the required ductility, tensile strength, flatness and surface to meet **your** exact specifications.

Why not call or write your nearest Youngstown District Office, today, for metallurgical assistance or additional information—or write directly to our Home Office.

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bly-line basis. In addition to providing better bonding results, advantages gained by the infrared drying process include a reduction in drying time to a matter of seconds. This helps conserve valuable floor space, speed up processing and shipping operations.

Strengthens Bond—In many cases, radiant oven drying provides a very strong bonding of materials. It prevents moisture condensation on the laminate. A special ventilating system removes solvents from the adhesive during the heating process.

Fostoria Pressed Steel Corp., Fostoria, Ohio, a manufacturer of infrared ovens, reports at least three new bonding applications using adhesives, plus radiant heat, in the building, office equipment and home appliance manufacturing industries.

Some Oven Uses—One involves the bonding of paper honeycomb cores to aluminum skin in making storm doors. Another, the bonding of honeycomb and other materials to the outer skin of building panels. And the third, the bonding of plastic laminates to desk tops and the tops of dishwasher cabinets.

Adhesive-coated steel sheets pass through a drying oven.

The honeycomb application, in particular, seems to offer good possibilities for increased utility and economy. This is because the material itself is strong, yet light-in-weight. It is readily adaptable for bonding to a variety of materials, too.

One Man Moves Parts, Works Two Blasters

Without the use of power transportation, a lone worker conveys castings around a foundry between three work stations. At the same time he also operates two airless blast machines.

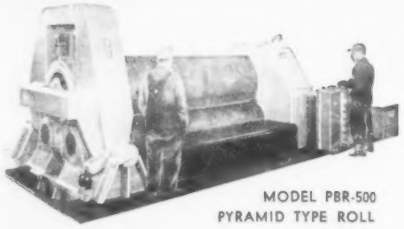
Making use of an ingenious handling system, one man at Dalton Foundries, Inc., Warsaw, Ind., operates two Wheelabrator Tumblasts while moving parts around the shop. The castings travel from the grinders to the cleaning mills to the inspection stations with no power handling whatsoever.

Setup Is Simple—The system is

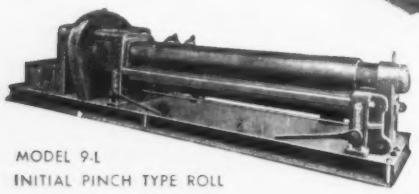
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL PBR-500
PYRAMID TYPE ROLL

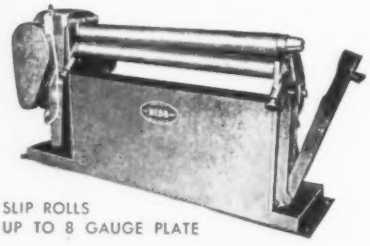


MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.



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UP TO 8 GAUGE PLATE

Let Speed PAY—The WEBB Way!

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PYRAMID TYPE ROLL

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STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881 THE WEBB® CORP.
WEBB CITY, MO., U. S. A.

simple. It consists merely of: (1) two shuttle cars which roll on tracks, and (2) four banks of roller conveyors.

Conveyors carry tote boxes away from the grinders to another conveyor. This carries them to the Tumblast loaders. Another conveyor moves them to the unloading station in front of the Tumblast mill. Still other conveyors carry them to the inspectors.

Hydraulic Lift—Since the unloading conveyor at the airless blast machines is necessarily lower than the others in the system, a hydraulic lift permits lowering the shuttle cars to the proper level.

Discharging the contents of a tote box into the blast unit's loader is handled very simply. A two-pronged lifting hook, attached to an

Operator places filled tote box on a rail shuttle car.

electric chain hoist, is inserted into holes in the back of the container.

Actuating the hoist raises the back of the box. This causes it to pivot at the front, thereby dumping the work into the loader bucket. The tote box is then conveyed around to the front of the mill for unloading. Here, it's moved up to the conveyors where the work is inspected.

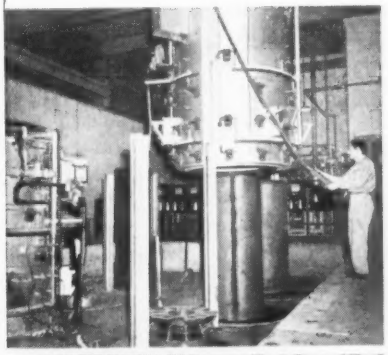
Old Tool; New Twist

When everything else fails, try a pair of pliers. This might well be the motto of a firm that uses the hand tools to help work hard-to-work carbide dies.

Pliers of various sizes prove an important production aid at Bron-

Bright Annealing?
Normalizing?
Nitriding?
Spheroidizing?

You can't beat CONTINENTAL TOP HAT



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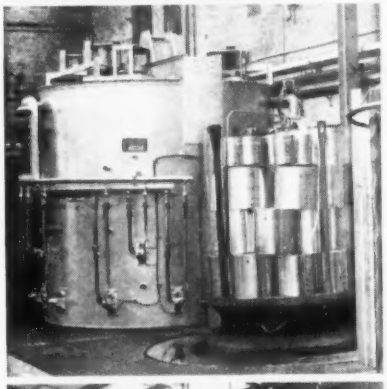
Extra large volume of recirculating atmosphere.

Highest Production per Unit

Versatility
Can be used for bright annealing, normalizing, nitriding, or spheroidizing coiled wire or strip—ferrous or nonferrous.



High Efficiency
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Long Hood Life
No flame impingement.

Full particulars and recommendation for any job on request.

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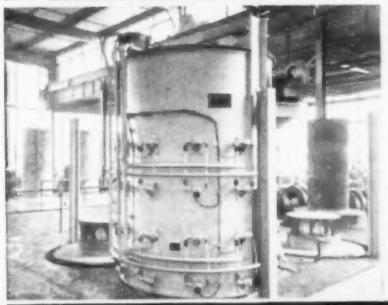

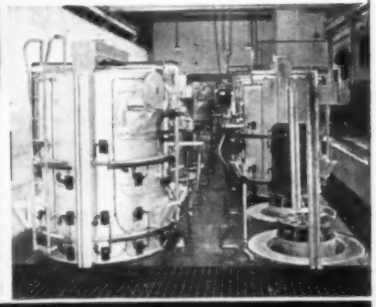

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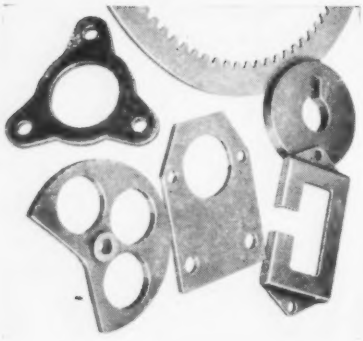

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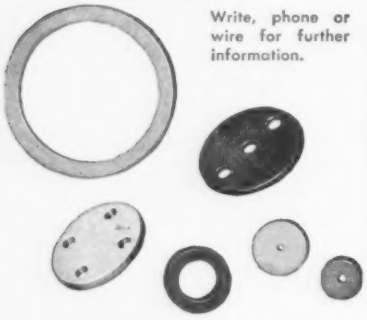
Write, phone or wire for further information.



Cleveland Pressed Products Corporation
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VUlcan 3-7900

TECHNICAL BRIEFS

son & Bratton, Inc., Chicago, in boring tapers of special Carboloy carbide die inserts for forming brass shell casings. The company's lathe operators employ pointed-nose

Pliers sub for a conventional toolholder on this lathe job.

pliers to hold a diamond cutting edge against a die turned at 100-sfpm on a bench lathe.

Get Dull Quick—Diamond edges, in this work, do not stay sharp long enough to use permanent holders. Actually the use of diamonds for this operation is an art in itself. It not only involves skillful use of bits and pieces of diamonds, but also the finding of tiny sharp cutting edges of the diamond to apply to the work.

Cadmium Brightener

Fast plating, brightness and long life are claimed for a new cadmium brightener. One pound of the material covers an area of approximately 112 sq ft when applied in an 0.0002-in. thickness. Because it is anodic to iron, it affords good corrosion protection. Smoothex, inc., Cleveland, makes it.

Welds Ti in Bag

It's in the bag. The welding operation, that is.

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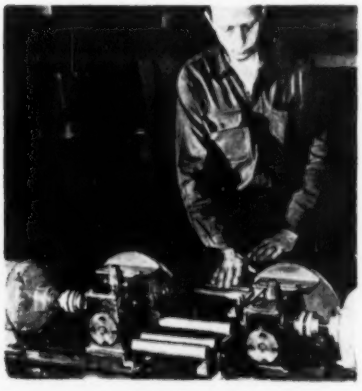
facturers in their production of welded titanium parts. According to Mallory-Sharon Titanium Corp., Niles, Ohio, the plastic enclosure

Welding in a polyethylene bag reduces corrosion worries.

allows titanium to be heated at welding temperatures without contamination of the metal. An inert gas atmosphere is maintained inside the bag.

Two-End Brush Burrer Boosts Production

End finishing of copper and brass tubing is up 200 to 400 pct at one company. The firm credits this production boost to its use of a double-



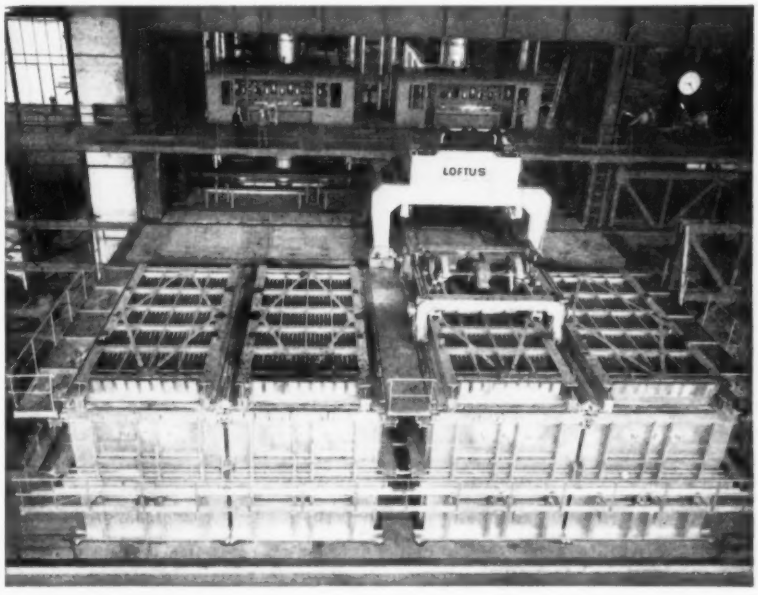
An operator feeds tubes across; the unit deburrs them.

end brush burring machine. This replaced the more conventional hand-holding against a power brush.

Now in use at Calumet & Hecla, Inc.'s Wolverine Tube Div. plants, the special machine meets rugged quality control standards. These call for careful removal of all burrs from both the inside and outside diameters of all tubing cut into short lengths. This must be done prior to shipment to a customer.

Was Hand Brushed — Earlier methods for removing burrs employed hand brushing sometimes. More frequently, it entailed hand-holding against a power wire brush. Both these being too slow, the company set out to find a faster, better way.

Eventually, the firm's own shops came up with the double-end wire brush burring unit. Each brush is actually two 1-in. Osborn brushes mounted on one spindle. Both brush sets are direct-geared to a ¾-hp motor. Each assembly of motor, gear set, and brush mounts on a movable base so that varying lengths of tubing can be accommodated.



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TECHNICAL BRIEFS

Supports Bases—The two bases are supported by a welded, angle iron section work table. This table's top has grooves which permit the bases to slide apart or together easily.

In operation, a number of tube lengths are placed between the feed guide and the rails. They are then pushed past the brushes spinning at 1850 rpm. This slight pushing action causes the spinning brushes to rotate the tubes as they pass the brushes. This results in uniform, even deburring action around the entire perimeter of the cube.

Once-over Keeps Boilers Working

During winter most industrial plant boilers operate on a double-duty basis, particularly where extra heating loads are concerned. Normally these loads taper off as warm weather approaches.

Most maintenance men consider the summer as ideal for general boiler maintenance. They then

Here a maintenance man expands a boiler tube.

have ample time to get the boiler ready for the coming heavy-load season. Thus they eliminate the possibility of serious shutdown due to improper maintenance. According to engineers of Thomas C. Wilson, Inc., Long Island City, N. Y., this summer once-over often turns

WHEN THE BOTTOM DROPPED OUT of the ERIE CANAL

Of the many noteworthy events that took place back in 1907, one of the most unusual occurred near Syracuse New York, where a part of the bottom of the Erie Canal dropped out. Four canal boats were sucked through and shattered; a flour mill was badly damaged; and there was a loss of over $500,000. This catastrophe may sound more believable when we tell you that the break occurred on a viaduct over Onondaga Creek.

In a more constructive vein, a happier (if less publicized) event occurred in Cincinnati in the same year, when Soren Sorensen and John Christensen founded what was to become The Cincinnati Gear Company.

In the ensuing fifty years, many changes have taken place. People no longer ride on canal boats; and the gear-manufacturing business has progressed similarly. Technologically we've been in the forefront of this progress, but we've also tried to preserve some of the attention to detail and "craftsmanship" that prevailed in those earlier times. The result has been a gratifying record of customer satisfaction — the kind of satisfaction we'd like *you* to experience on your next custom gear order.

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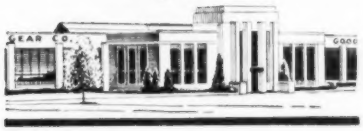
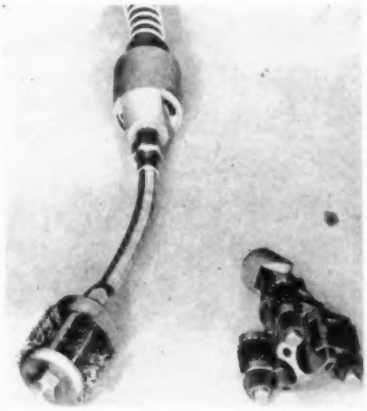


up minor leaks and malfunctions. These can be quickly and easily taken care of before they become serious.

Replacing Tubes—Operations accomplished during this annual check-up may consist of cleaning, tightening, and, where necessary, replacing tubes, the inspection of valves, gages, and refractory, and cleaning and inspection of other



Basic cleaning tools include brushes and cutterheads.

boiler fixtures. In many plants, maintenance of tubes proves to be the major portion of the annual spring or summer check-up.

A number of tools are available to make the job somewhat easier to perform. Tube cleaners are recommended for removing scale or other fouling material from boiler tubes; they usually do a thorough cleaning job in a short time. Various accessories may be employed, such as cutter heads and expanding brushes, depending on the type and extent of scaling.

Goes Around Bends — Where maintenance men run into return tubular sections, such as economizers and superheaters, universal expanding brushes can be used with standard tube cleaners. These devices negotiate bends.

Air preheaters, if properly maintained, are easily cleaned of their normal light deposits. However, these units some times are overlooked for several years. Considerable scale may then be encountered, requiring the use of drill-type cleaners with their scavenging air or jet.

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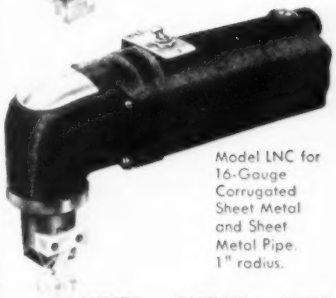

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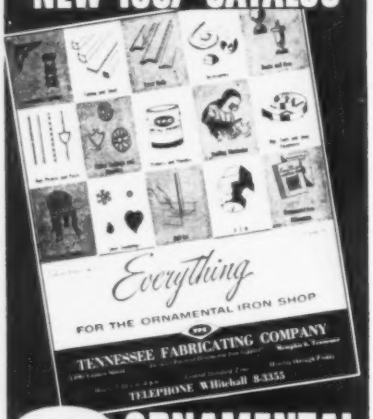

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TECHNICAL BRIEFS

Teams Forming, Cutoff Setups; Ups Output

Integrating their roll-forming, cutoff and punching operations boosts production 300 pct for one manufacturer. The firm does this in its making of fixed fins from coil steel.

The fins, turned out by Waterloo Register Co., Inc., Waterloo, Ia., are for air exhaust units. Previously the fins were made by cutting to length and punching a hole in each

Feed of the roll-former is controlled by an operator.

end. The two operations (parting and punching) were done simultaneously. Then the pieces were formed to 45° or hemmed and flattened. Not only was a second machine necessary to form the 45° angle but a third machine was required for the hemmed fin. Moreover, difficulty was experienced in handling short pieces. Scrap was high.

Today's Method—Now the strip feeds continuously from coils through the roll-forming machine. This forms the strip to the required angle and feeds it directly into the punch press about 15-ft away. The press cuts off the formed shape and pierces in one operation. There are two stations arranged permanently in the roll form machine. One is for the 45° angle and the other for the hemmed edge.

The operator at the punch con-

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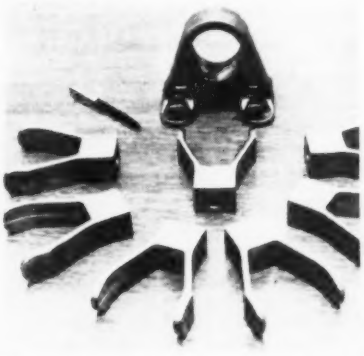
trols the feed of the roll former by a micro-switch with his left foot. When the correct length of stock has been fed from the roll former into the punch, he stops the feed with the micro-switch and cuts off and punches with his right foot.

Water Cools Molds For Titanium Casting

Water cooled copper and graphite molds are being successfully used by a company in its operation of a consumable electrode furnace for producing titanium and zirconium castings. The furnace has a 100-lb capacity.

Since titanium and zirconium in the liquid state react with every known element except argon and



These castings were produced by the new process.

helium, the mold itself is contained in the melting furnace. At the end of the melting process, the entire furnace, mold and all, is rolled over, pouring the liquid metal into the mold.

High Tensile Strength—Castings of 125,000-psi tensile strength are produced, with higher tensile alloys being developed. Oregon Metallurgical Corp., Albany, Ore., currently working with the unit, reports that castings will soon be available as pure titanium, zirconium or alloyed with aluminum, vanadium, tin, chromium, manganese, molybdenum or in almost any conceivable alloy combination.

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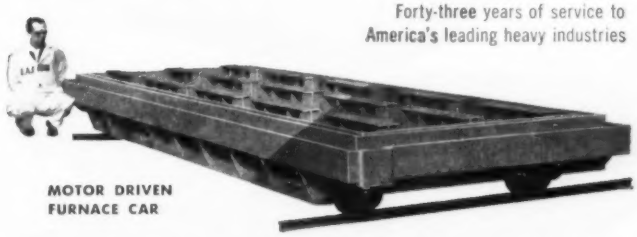

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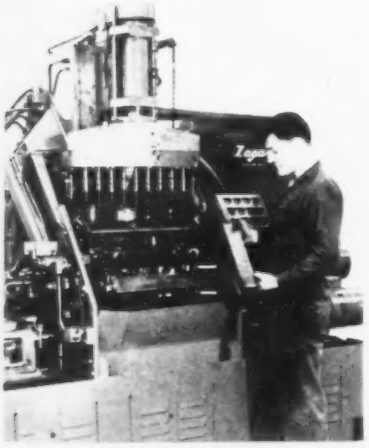
New Production Ideas

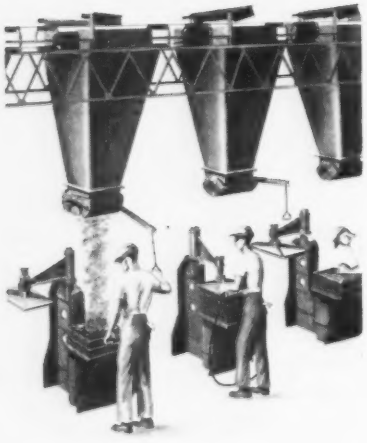
Equipment, Methods and Services



Multi-hole Unit Drills, Taps and Reams

Simultaneous multi-hole drilling and reaming from three sides is done by this machine. And this is in addition to tapping. The machine features fully automatic cycling which is electrically interlocked. Tooling on the unit will adjust for parts ranging from 12 to 24-in. long. At the first station, a single hole is drilled in each end of the part. At station two, the drilled holes in the ends are reamed simultaneously with the drilling of eight holes on the flat side of the part. These eight holes are drilled by a multiple-spindle drill head located at the rear of the machine. At the third station, the eight holes drilled at station two are tapped by a drill head found at the front-top position of the machine. At station four, loading and unloading of the fixture is done. Multi-hole drilling, reaming and tapping are performed by multi-spindle gearless heads, fed by hydraulic feed units. (Zagar, Inc.)

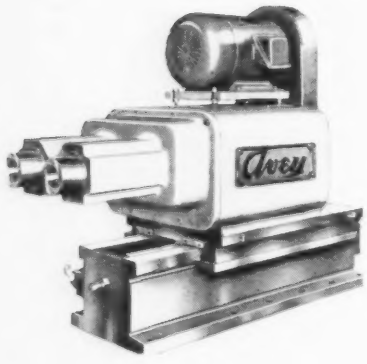
For more data circle No. 41 on postcard, p. 113



Unit Fills Sand Molds From Overhead Setup

Tired of shoveling sand into molds? Want to up your sand molding operations? Maybe this is just what you're looking for then. It's an overhead unit that fills molds with sand for overhead hoppers. To work it, an operator merely pulls a lever. No shoveling is necessary. This eliminates piling of sand on the floor which frees floor space for more valuable use. It works like this: Conditioned sand from a sand preparation plant is brought in by a front-end loader and dumped into the feeder hopper. From here, it's discharged by a mechanical vibrating conveyor with a stainless steel pan. It moves to a vertical belt-type bucket elevator with malleable iron buckets. From the head of the bucket, elevator sand is discharged through a chute onto a flat belt conveyor. This has plows which divert sand into each molder's hopper. The operator just pulls a lever on the clam shell valve for sand delivery. (Jeffrey Mfg. Co.)

For more data circle No. 42 on postcard, p. 113



Attachment Cuts Drill Breakage In Deep Holes

Thanks to a new attachment, drills won't break as often while drilling deep holes. According to the manufacturer of the device, the unit virtually eliminates breakage in such cases. The attachment's new design allows the exact setting of torque on Avey deep hole drilling units. The equipment is calibrated so that a given number may correspond to a desired drill diameter. This assures proper torque on the drill, which is automatically withdrawn any time this torque is exceeded. Drill diameter charts corresponding with the setup's calibrations may be prepared on any drilling job. The operator simply checks the chart to find the correct setting for each drill change. (Motch & Merryweather Machinery Co.)

For more data circle No. 43 on postcard, p. 113

WHICH of these Actuation Problems are YOURS?

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- ☐ SPACE/WEIGHT
- ☐ PRECISION
- ☐ TEMPERATURE
- ☐ LUBRICATION
- ☐ DEPENDABILITY

SAGINAW b/b SCREWS will help you solve them!

ORIGINAL DESIGNERS AND PRODUCERS OF MULTIPLE CIRCUITS

If one circuit should fail, the rest will function without interruption, sharing the load between them. In critical applications this feature has no equal.

6 BASIC DESIGN ADVANTAGES

1. Vital Power Savings. Permit much smaller motors with far less drain on electrical system, simpler circuitry.

2. Space/Weight Savings. Screws themselves are smaller, lighter; permit smaller motors and gear boxes; eliminate auxiliary equipment required by hydraulics.

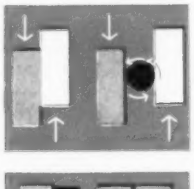
3. Precise Positioning. Machine-ground type will position components far more precisely than hydraulics or pneumatics; tolerances on position are held within .0006 in./ft. of travel.

4. Temperature Tolerance. Normal operating range from −75° to +275° F.; in selected materials, will function efficiently at temperatures as high as +900° F.

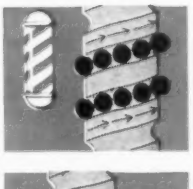
5. Lubrication Latitude. If lube fails, will still function with remarkable efficiency. Units have been built and qualified for operation without lubrication.

6. Fail-Safe Performance. Far less vulnerable than hydraulics; Gothic-arch grooves, yoke deflectors and multiple circuits provide added assurance against failure.

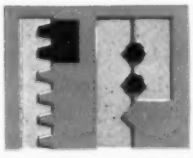
Here's why they're 90% efficient, save 4/5 on torque:



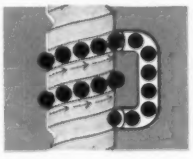
Let's start at the beginning, with the familiar principle that there's far less friction in *rolling* than in *sliding*. By applying this principle,



Like stripes on a barber pole, the balls travel toward end of nut through spiral "tunnel" formed by concave threads in both screw and mating nut.



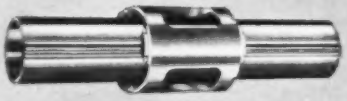
the *Saginaw ball/bearing Screw* radically increases the efficiency of rotary-to-linear motion (and vice versa). Instead of *sliding*, mating surfaces *glide* on rolling steel balls.



At end of trip, one or more tubular guides lead balls diagonally back across outside of nut to starting point, forming closed circuit through which balls recirculate.

Available in custom machine-ground and stock rolled-thread types. Units have been built from 1½ inches to 39½ feet long—⅜ to 10 inches in diameter.

SAGINAW b/b SPLINE



This revolutionary new kind of spline utilizes the same basic principle pioneered by Saginaw in the ball bearing screw.

It permits new engineering designs never before practical—literally lets you achieve the "impossible"! In any application where column length must change under torque load, the Saginaw b/b Spline offers greatly decreased friction, less wear, longer life, more dependable operation. It can be fitted with integral gears, clutch dogs, bearing and sprocket seats or a wide choice of other attachments for use with electric, hydraulic or pneumatic units. To convert push-pull to rotary motion, helical types are available with very high leads, ranging from 20:1 to 100:1.

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Saginaw ball bearing Screws and Splines

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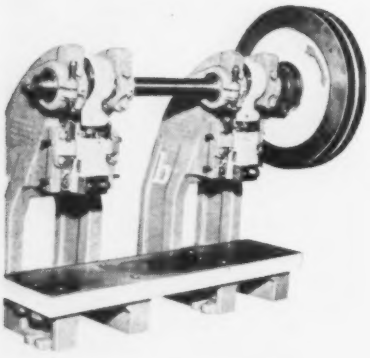
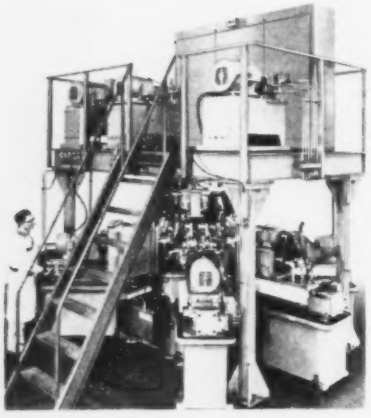


Press Duo Serves as Small Press Brake

Custom-designed to perform the functions of a small press brake is this adaption of two small presses. The multiple ram setup consists of two 5-ton fixed bed gap frame presses operating in tandem from a single crankshaft common to both presses. The two press frames are separated by 18½-in. between ram centerlines. They are held in alignment by a single bolster plate measuring 37-in. long x 8-in. wide x 1½-in. thick. The crank has a stroke of 1⅛-in. and operates at 230 strokes per minute. Total tonnage developed is 10 tons. With this type construction any normal separation of press frames is practical, making for wide flexibility of overall bed capacity and easy adaption to an almost unlimited variety of workpieces. (Benchmaster Mfg. Co.)

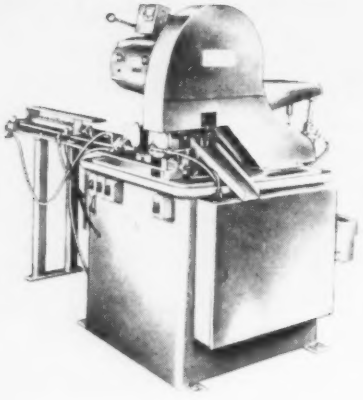
For more data circle No. 44 on postcard, p. 113



Machine Automatically Works, Positions Parts

Using unique automatic devices, this eight-station rotary index machine accurately positions and machines the bore and hub face of production parts. These are worked at high production rates. Taking up comparatively little floor space, the machine spot faces, reams, bores and bearingizes the sintered iron bore and thrust face of 6-in. diam automotive pump parts at a production rate of 700 pieces per hour at 80-pct efficiency. By changing the fixtures and heads, this unit can adapt to a variety of both large and small parts needing accurate machining. It features 16 overcenter toggle type clamping fixtures which automatically center and square the part and clamp it in position prior to machining. An expandable rubber unloading mechanism removes the part from the fixtures after machining. (Expert Automation Machine Co.)

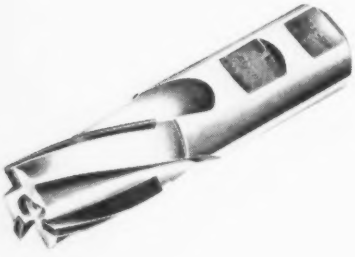
For more data circle No. 45 on postcard, p. 113



Unit Cuts Off Ferrous, Nonferrous Metals

This powerful cut-off machine is a fully automatic unit. It's powered by a 10-hp, continuous duty, totally enclosed fan-cooled ball bearing induction type motor. The cutoff unit cuts ferrous metals with an abrasive wheel and nonferrous materials with a saw blade. The geared-in-head motor delivers all the power to the cutting edge. Tolerances are held to ±0.010-in. on production runs. The machine has an automatic stock feed to accommodate a wide range of shapes, lengths and diameters and will handle any material from aluminum to hardened tool steel. An abrasive wheel wear compensator automatically adjusts for fast, accurate cutting; this adds to wheel life, too. The unit comes for manual or semi-automatic operation; where greater power is needed, a 15-hp motor is available. (Stone Machinery Co., Inc.)

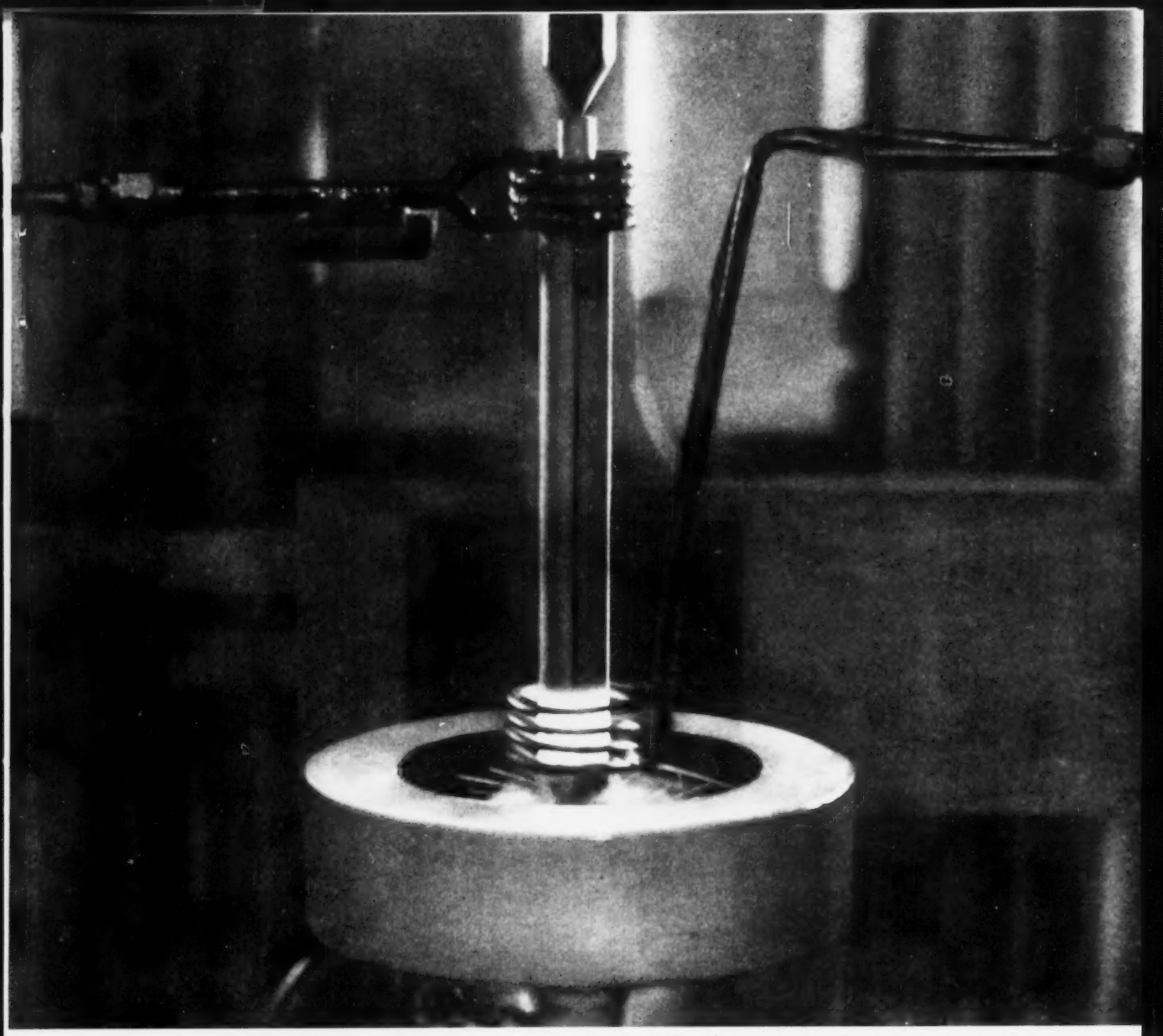
For more data circle No. 46 on postcard, p. 113



End Mills Work on High Speed Jobs

Made for working with high speeds and feeds, a series of carbide tipped end mills feature helical cutting edges. These edges are the result of a special process that produces a true helix with a constant positive rake for the entire length of the tooth face. This permits high speeds and feeds when milling cast iron and light metal alloys, for which the tools were primarily designed. However, they can also do light work on steels too. Standard stocked diameters: from ⅜ to 2-in. (Goddard & Goddard Co.)

For more data circle No. 47 on postcard, p. 113



Ketos shaft being induction hardened to Rockwell 55-56, while ends remain soft for final machining. Photographed at Control Instrument Co., Inc., Brooklyn, N. Y.

KETOS has wide hardening range with minimum volume change...

Ketos is a low priced alloy tool steel that can be hardened from low temperatures with practically no volume change. It has deep hardening qualities, and a fine grained structure, that make it desirable for many production parts.

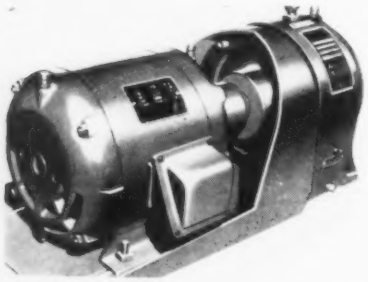
That's why nondeforming Ketos is well suited not only for most tool steel applications such as gauges, dies, and taps but also for close-tolerance, wear-resistant parts like the actuator bar shown in the induction heating unit above. The thin contact edges of this particular part withstood a "life test" of over 4-million high speed blows. No other steel tested lasted more than 1-million cycles before it chipped and failed.

If Ketos sounds like the steel you should be using, call your nearby Crucible warehouse. Stocks of Ketos and dozens of other special tool steels are large, delivery fast. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.



Gearmotor's Main Theme Is Simplicity

Simplicity keynotes this speed reducer. When changing motors, loosening four bolts frees the motor from the end shelf and uncouples the flexible coupling. The motor then may be removed and replaced with another standard stock motor in a few minutes. The mounting slots in the end shelf are standardized to conform with standard NEMA dimensions. Motor capacities range from 1 to 75-hp. Each reducer has an output speed range from 350 to 7½-rpm. (Howell Electric Motors Co.)

For more data circle No. 48 on postcard, p. 113

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the Sensational *NEW*
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GOLD STAR
SR

It *DELIVERS* maximum arc stability for:
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b. ALL electrodes, in . . .
c. Any and all positions

How is this performance possible? THE MILLER GOLD STAR SR introduces a . . .
NEW transformer
plus
NEW weld stabilized current
plus
NEW completely sealed semi-metallic rectifier

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Tested across the country by practical, critical, hard-bitten working weldors, here's what they say about the new Miller GOLD STAR SR:
"it's the DC performance I've always wanted"
"here's DC welding current that's . . . perfect!"
"positively handles ALL electrodes better"
"best deal I've seen for v and o work"
"easiet arc starting in my experience"
"smoothest arc I ever used . . . and . . . quiet!"
* "it's just plain the MOST"
Complete particulars on the MILLER GOLD STAR SR, including inert gas and automatic fixture welding, is now available on request.

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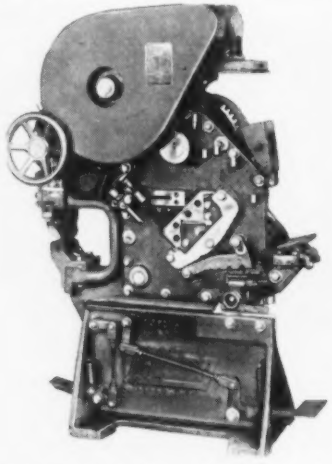
miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

Shear, Punch, Coper

High-speed punching, shearing and coping is done on this unit. The combination machine punches up to and including 13/16-in. diam holes in ⅜-in. thick steel plate, and



up to and including 11/16-in. holes in ½-in. plate. It shears up to and including 4 x 4 x 1¼-in. steel angles, 4 x ½-in. flat bars, 1⅜-in. round bars, 1¼-in. square bars, and ⅜-in. thick steel plate. It also notches and copes. (Joseph T. Ryerson & Son, Inc.)

For more data circle No. 49 on postcard, p. 113

Magnetic Sweeper

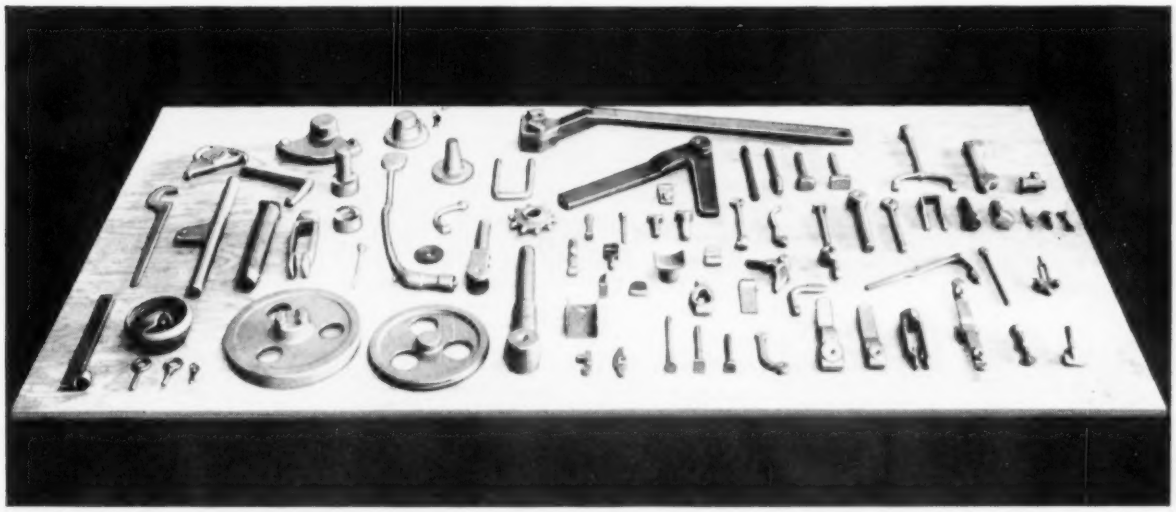
A redesigned hand sweeper has a permanently magnetic "brush" which makes it handy for picking up stray bolts, nuts, shavings, etc. It comes in sweeping widths of 12, 18, 24 and 36-in. (The Homer Mfg. Co., Inc.)

For more data circle No. 50 on postcard, p. 113

200 Different Parts Heated for Forging -

Better, Faster and at Much Lower Cost

with TOCCO Induction Heating*



• When progressive production people at General Railway Signal Company installed a 200 kw, 3000 cycle TOCCO machine, they were able to eliminate 7 slot-type oil-fired furnaces and produce better forgings than ever before—at substantially lower costs.

Cost Down—Fuel costs have been reduced from $15.26 to $1.60 per hour with TOCCO. Expensive furnace lining maintenance has been eliminated, and straightening and reheating operations formerly required are no longer necessary.

With oil-fired furnaces all steam hammer operators needed helpers. With TOCCO most of these helper operations have been eliminated.

TOCCO's fast, automatic operation produces almost no scale and achieves uniform temperatures throughout the entire cross section—improving the quality of the forgings and providing increases of up to 40% in the life of the forging dies.

Overall production costs in the forge shop at G.R.S. have been reduced an impressive 35%!

Flexibility—Production runs at G.R.S. range from a low of 15 pieces to a high of over 50,000. Parts from ½ pound to over 25 pounds are heated, merely by changing inductor coils and power control settings.

Better Working Conditions—TOCCO makes the forge shop a better place to work by doing away with noise, dust, dirt, smoke and radiant heat and gases produced by old fashioned furnaces.

If you're looking for a way to produce similar results in your plant, it will pay you to consult a TOCCO Engineer.

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Please send copy of "Typical Results of TOCCO Induction Heating for Forming and Forging".

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BRASS with laminations of .002" or .003"	**LOW CARBON STEEL** with laminations of .002" or .003"

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3206 Union Street, Glenbrook, Conn.

NEW EQUIPMENT

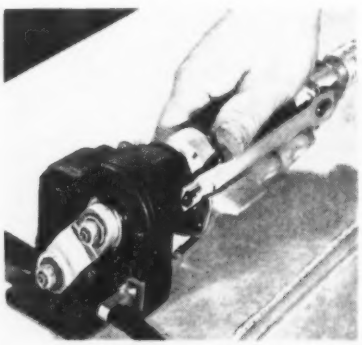
Pipe Fitting

Two fittings in one; that describes a single aluminum alloy fitting. The unit holds both vertical and horizontal pipe or tubing. It's designed for economical use wherever structures of pipe and tubing are required. Four of the fittings will support in excess of 20,000 lb without extra bracing and without deforming the fitting. Made of strong, lightweight aluminum alloy, the unit is corrosion resistant. (John H. Hoskins Co.)

For more data circle No. 51 on postcard, p. 113

Power Strapper

This power operated steel strapping tool weighs less than four pounds. Featuring unlimited take-up, the air-powered tool is fast, light and quiet. It comes in every traditional width: ⅜, ½, ⅝ and ¾-in. straps. The tool adjusts to all gages in the width it handles. It comes equipped with 8-ft of air hose and coupling. (Brainard Steel Div., Sharon Steel Corp.)



For more data circle No. 52 on postcard, p. 113

Numerical Controls Operate Drill Press

This drill press is positioned automatically by means of a numerical control. The control employs a system in which digital techniques are used throughout, both in the straight-through portion and in the feedback loop. Electronic components applied to the drill press are readily adaptable to other types of machine tools in which positioning of the work or tool to a given spot is required. These include automatic welders, punches and stampers. Instructions to the electronic components are given through a punched tape. In this particular machine, the work moves automatically to any square on a 1/64-in. grid within an area of 8 x 16-in. Drilling rate is one hole per second. The system could be adapted to such modifications as a turret head or a decimal grid of less than 0.001-in. (Laboratory for Electronics, Inc.)

For more data circle No. 53 on postcard, p. 113

High Speed Lathe

For high-speed, high-horsepower service with modern carbide tooling, a recently developed 50-in. engine lathe accommodates a drive motor up to 100 hp. It comes either as a standard lathe or as a combination boring and turning machine. Other options include use of mechanical or electronic feeds, and with or without thread cutting. The lathe has a 50-in. diam faceplate and swings 38-in. over the carriage bridge, 52 in. over carriage wings and bed. (Hamilton Div., Baldwin-Lima-Hamilton Corp.)

For more data circle No. 54 on postcard, p. 113

Blowgun Cleaner

Waste cuttings, dust and particles are cleared from work surfaces with a new blowgun. And it forms its own protective shield whenever used. Some 40 pct of the air intake forms the shield whenever its operator depresses the trigger. This shields him from any flyback. (E. V. Nielsen, Inc.)

For more data circle No. 55 on postcard, p. 113

Humidity Indicator

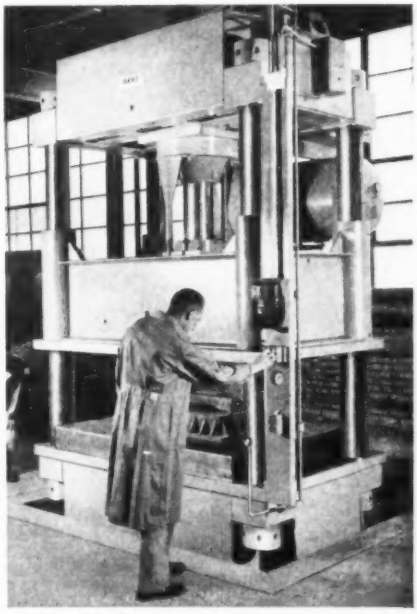
For remote use, a new indicator measures humidity of closed areas. The indicator itself can be in a place away from the area measured. An air line running into the area makes this possible. A vacuum pump or line draws sampled air

PROBLEM

to produce low-cost prototypes of a new design without the high cost of permanent tooling

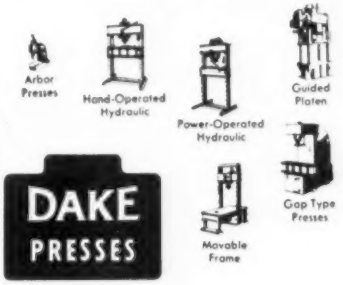
SOLUTION

a single 300-ton Dake Hydraulic Die Tryout Press with temporary tooling



Die tryout is a key operation for most die jobbing shops. This is the test that either proves or rejects a die before it is placed in production. But a lack of adequate press facilities is usually the big drawback. A well-known Chicago diemaker, Cripps Engineering and Tool Co., Inc., has effectively solved the problem of die tryout. Although they had a number of production presses, there was a need for greater die tryout capacity. Now with a single 300-ton Dake Hydraulic Press, this diemaker is able to test all dies before delivery to the customer. The result: shop down time is held to a minimum and production efficiency runs smoothly without interruption. Specifications for single-acting and double-acting die tryout presses in eighteen electrically operated models are contained in Bulletin 330. Write today for your copy.

DAKE CORPORATION, 602 Seventh St., Grand Haven, Mich.



SEND TODAY FOR BULLETIN 330

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602 Seventh St., Grand Haven, Mich.

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NEW EQUIPMENT

through the indicator. Installation of the instrument takes little effort. Only two connections are necessary —one from the inlet at the bottom of the indicator case to the air line from the container or area sampled; the other from an outlet at the top of the case to a vacuum pump or line. No wiring is needed; operation is mechanical. Conversion charts are unnecessary. (Serdex, Inc.)

For more data circle No. 56 on postcard, p. 113

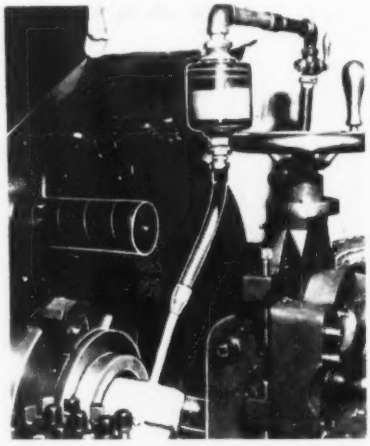
Turret Punch Press

High speed piercing of sheet or plate parts in low to medium production quantities is done on a new turret punch press. The 40-ton capacity machine, equipped with a high speed follower gage, eliminates setup and work layout. Flat sheet metal or plate to 33 x 40-in. is pierced in one handling. Work is located to close tolerances and pierced at a 30 or more holes per minute rate. (Wiedemann Machine Co.)

For more data circle No. 57 on postcard, p. 113

Foam Coolant

Operating on a jet principal, a new foam coolant unit keeps shop floors dry. The foam doesn't splash all over the place. Producing large volumes of light, cooling foam, the setup can be used at speeds of 1000-sfpm or more. Tests indicate



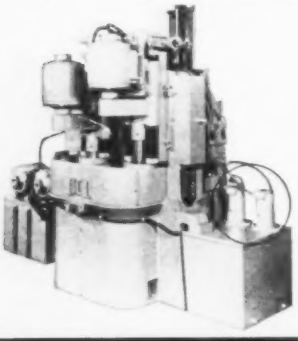
that the foam it produces has very good wetting qualities. Use of the unit might result in longer tool life, especially if the machine operator using it usually employs the turn-off turn-on principle with splash-type coolants. (Production Specialists).

For more data circle No. 58 on postcard, p. 113

Unit Welds Superalloy

A new special spot welder boasts a total of 3200 independent settings and a head pressure of 4000 lb. It is versatile enough to weld any of the existing superalloys, say its users. A specialist in the fabrication of prototype engines uses the welder in its production of sheet metal assemblies. These are made of such high temperature alloys as Inconel, Inconel-X, Hastelloy, N-155, and high temperature stainless steels. Sciaky Bros., Inc., Chicago, custom-built the spot welder. (Finn Aeronautical Div., T. P. Finn & Co.)

For more data circle No. 59 on postcard, p. 113

CONNECT THEM . . . FORGET THEM . . .
Ruthman Gusher COOLANT PUMPS
REQUIRE LITTLE MAINTENANCE
Ordinarily Gusher Coolant Pumps require no attention. Because there are no packing glands to adjust and they are equipped with heavy duty prelubricated for life, ball bearings. Your maintenance worries are minimized when you specify Gusher Pumps. **Write for our Catalog.**
THERE'S A GUSHER FOR EVERY REQUIREMENT

Illustrated is a Springfield Dual Spindle Vertical Grinder equipped with Gusher Coolant Pumps.

Model 6-P3 Immersed Type
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• CIRCULATORS • AGITATORS
• MOLTEN METAL PUMPS
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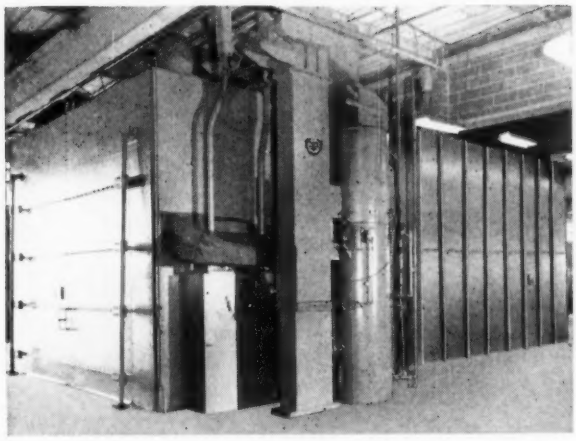

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The room installation illustrated was built by MACLEOD and is served by a continuous automatic blast generator, abrasive reclaiming and cleaning system, and a dust collecting system with a 54,000 cu. ft. per minute capacity. Write for information on MACLEOD standard or specially designed equipment.

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HOIST HOOKS

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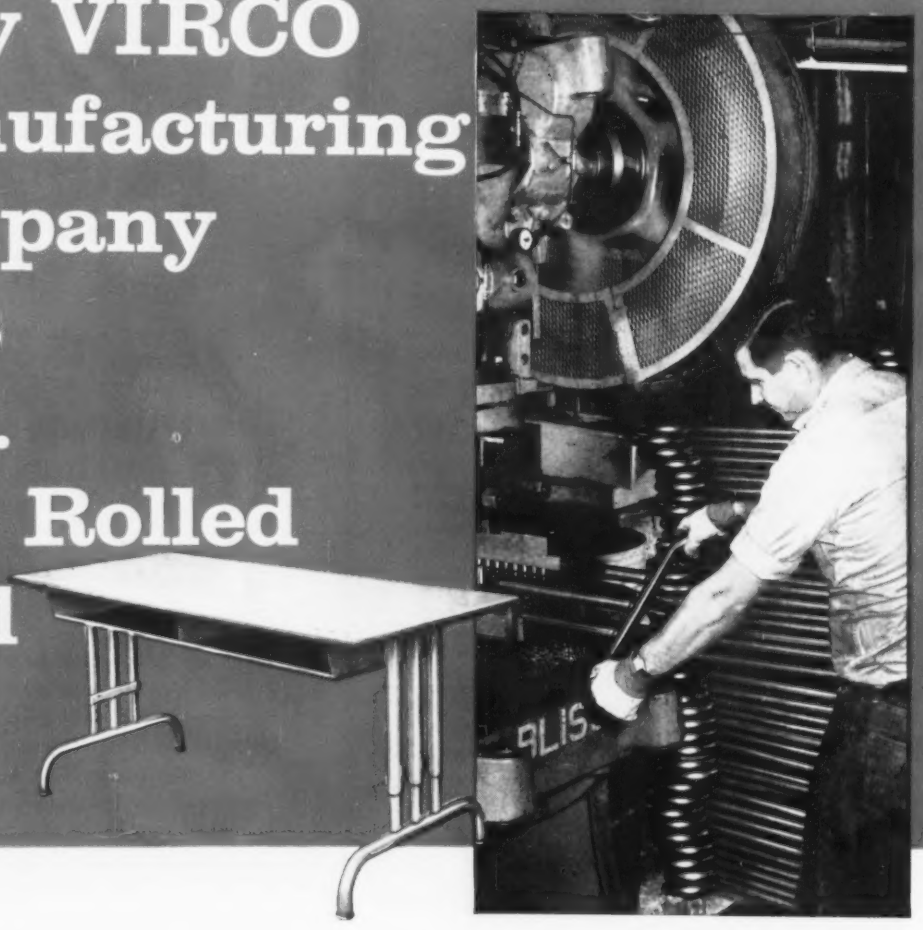
STREET_____

CITY_____ STATE_____

Why VIRCO Manufacturing Company uses A.W. Cold Rolled Steel



At Virco, a high-quality steel for tubing *must* be ordered!

At Alan Wood, a high quality steel *is* produced.

Alan Wood's own metallurgists investigate customer needs . . . then control the quality of the steel throughout their fully integrated production process—from mine to mill to market. Each customer receives the right steel for his product. As a result, down time and rejects due to poor steel quality are reduced, production increased . . . profits improved!

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Sand

COKE
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PENCO METAL PRODUCTS DIVISION
Steel cabinets, lockers & shelving

The Iron Age Summary

Watch For Fourth Quarter Surge

Make your plans include a pick-up in fourth quarter steel demand. Economy points that way.

Steel mills worry over reaction to expected price boost. It could work in your favor.

■ You can look for a pickup in steel demand in fourth quarter. The overall economic outlook points in this direction. It might be smart to keep a close tab on your inventories to avoid short-changing yourself should the market turn suddenly.

In fact, some steel mills were warning their customers about that this week. Granted that some of this talk is designed to stimulate buying in a slow market, there are some straws in the wind to indicate that the warnings should not be taken lightly.

Behind Expected Upturn—Some of the factors that will contribute to a stronger steel market:

(1) An unexpected revival of auto sales with new-model production; also the auto companies are likely to build up their dealers' stocks this winter and next spring as a safeguard against possible trouble during 1958 labor negotiations; (2) a reversal of user inventory policy from one of reduction to buildup; (3) continued high level of spending for new plant and equipment.

Seasonal Influences — (4) Heavy freight car backlogs; (5) oil and gas industry concentration on new drilling and laying of new pipelines; (6) a strengthening of export demand for steel, and (7) fall seasonal influences, an increasingly important trend in metalworking.

Heavy plate and structurals continue the strong points in the steel picture. Oil country goods also are in good demand, with most mills booked solid through third quarter, with some expecting heavy carryovers into fourth quarter. Light plate demand is taking up a lot of the slack on sheet-strip mills.

Export Pickup—Export demand for sheets has been improving steadily in recent weeks. Most of it is coming from British automotive plants, and some mills say export orders are taking up significant tonnages of sheet. Another encouraging factor for sheet mills: Auto companies say they will start producing new models in September—and that means greater tonnages of sheets will be ordered.

Steel producers are doing a lot of heavy thinking about the expected steel price boost in July. They're worried about customer and public reaction to the increase, when it comes.

Price Outlook—This concern over prices may work toward minimizing the amount of the increase after steel labor gets its wage boost. Some companies are beating the drums for as much as $10 a ton, but the actual increase probably will be closer to $6.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,253	2,214	2,228	2,314
Ingot Index				
(1947-1949=100)	140.2	137.8	138.6	144.1
Operating Rates				
Chicago	84.5	86.0	85.0	98.0
Pittsburgh	88.5	88.5*	91.0	95.0
Philadelphia	100.0	101.0*	102.0	103.0
Valley	74.5	73.0	72.0	92.0
West	106.5	103.0*	104.5	102.0
Buffalo	102.0	102.0	59.5	105.0
Cleveland	90.0	89.0*	80.0	96.0
Detroit	103.0	100.0	88.0	98.0
S. Ohio River	87.0	89.0	82.0	84.0
South	93.0	93.0	93.0	23.5
Upper Ohio R.	85.5	84.5*	87.0	103.0
St. Louis	55.5	84.0	84.5	97.0
Northeast	66.5	66.5	66.5	85.0
Aggregate	88.0	86.5	87.0	94.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.670	5.670	5.670	5.179
Pig Iron (Gross ton)	$64.56	$64.56	$64.56	$60.29
Scrap, No. 1 hvy (Gross ton)	$56.17	$54.83	$47.17	$44.83
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	25.90
Copper, electrolytic	32.00	32.00	32.00	46.00
Lead, St. Louis	13.80	13.80	14.80	15.80
Magnesium ingot	36.00	36.00	36.00	34.50
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	98.125	98.125*	97.75	94.625
Zinc, E. St. Louis	11.00	11.00	11.50	13.50

*Revised

No Strain in Buying Abrasives

Your relations with abrasives salesmen should be pleasant.

Market is strong enough to keep producers happy; competitive enough to assure good services. New standard should help.

■ Abrasives buyers and sellers look forward to a mutually satisfactory year. Producers' chief sales worry is whether 1957 will pass the record set in 1956 or merely equal it.

Availability and deliveries will continue to be excellent, and some further improvement in deliveries is hoped for. Prices should stay level, with any possible increases described as "insignificant."

All Agree—This is the outlook for the industry as reflected in an IRON AGE survey of leading abrasives producers. Answers to the questionnaire were almost uniform. This competitive industry has its internal problems, but the outlook for the buyer is excellent.

Raw materials are readily available in abundant supply, and present manufacturing capacity is ample. A few firms are still finishing up expansion projects, but generally the industry feels it can handle any foreseeable volume of business. Maintenance of the present price level for the next six months at least was stressed.

New Products Coming—The industry continues extensive research and development work, with virtually every firm indicating that it has a new or improved product up its sleeve.

Several companies put particular stress on new grinding machines with higher speeds, capacity for heavier loads and accurate work.

New Standards—Buyers of grinding wheels in particular are expected to benefit from a new standard, Simplified Practice Recommendation R45-56, to be issued by the Grinding Wheel Institute in July.

This new standard, which complies with U. S. Commerce Dept. requirements, should bring faster deliveries, simplified buying and inventory and more versatile products to the wheel user, according to GWI spokesmen.

Market Factors—Grinding wheel producers at the meeting shared their industry's optimism. Slight disappointments in sales to the automotive industry have been offset by needs of industrial expansion, steel and construction, to list just a few.

Chief abrasives markets are spotlighted in a recent IRON AGE market research study of 1955 abrasives sales. The study broke down total sales for both grinding wheels and coated abrasive belts and discs by market classifications, showed the top six for each group to be:

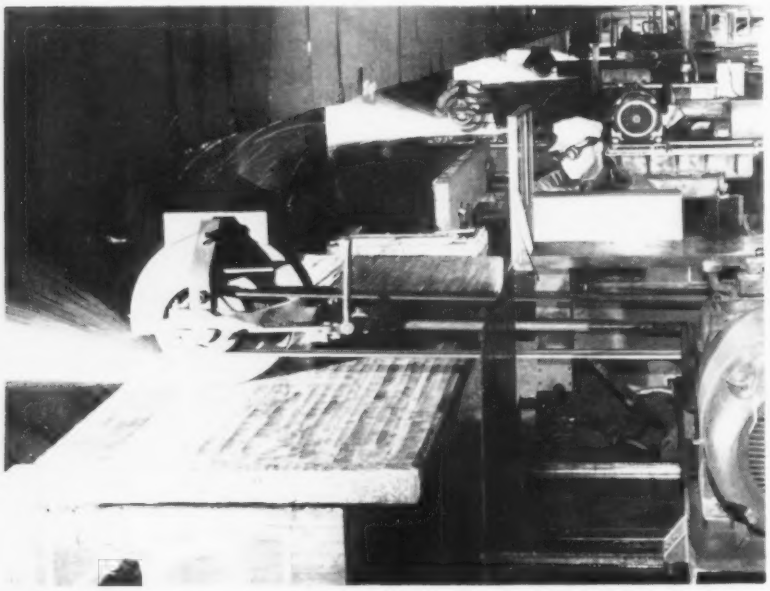
Grinding Wheels

Motor Vehicles & Parts	$26,836,229
Steel Works & Rolling Mills	23,360,000
Ball & Roller Bearings	10,928,934
Aircraft Engines & Parts	9,187,210
Steel Foundries	6,392,191
Cutting Tools, Gages & Dies	6,325,717

Coated Abrasive Belts & Discs

Motor Vehicles & Parts	$19,272,741
Aircraft Engines & Parts	8,426,702
Steel Works & Rolling Mills	3,729,843
Aircraft	2,757,700
Aircraft Propellers	1,852,000
Nonferrous Foundries	1,741,314

Total sales as determined by the study for grinding wheels were $160,793,607; for coated abrasive belts and discs, $68,591,341.



GOOD YEAR: Availability and deliveries of abrasives, like these billet grinders at Allegheny Ludlum Steel Corp., will continue good.

Service Is Factor In Slack Market

Producers overlooking no possibilities in drive for new business.

Light plate being worked into sheet schedules; bar mills are juggling product mix.

It's sales, not efficiency, that's calling the tune.

▪ Customer service is getting the lion's share of attention from mills in the current slack market.

Producers on the hunt for orders are overlooking no possibilities for snaring business. Sheet producers, for example, are using stocks of hot-rolled bands to speed processing of buyer requests for cold-rolled product.

Interest in Plate—And as long as customers show interest in sheet mill plate, the producers are making every effort to get it out. Those with large light plate backlogs are working the product into their regular sheet schedules. The light plate business is welcomed for its role in keeping up sheet mill operations.

In the bar market similar efforts are being made to bend mill operations to fit buyer needs. Cold finished bar mills are juggling their product mix to suit customer requests. They're doing it by scheduling shorter production runs in a wider assortment of products.

All in all, sales, not operational efficiency, dictate mill rolling schedules at the moment.

Sheet and Strip — Orders are down sharply for July. Vacations, auto model changeovers, and letdown from June's hedge buying are the contributing factors.

Hot, cold, galvanized and electrical sheets are all lagging at **Pittsburgh.** Some sources feel there wasn't too much hedge buying. One mill estimates only 5 to 7 pct of July tonnage was moved up to June. At present, August ordering is expected to be on a par with June's.

Some better buying by the warehouses is indicated at **Philadelphia.** With fast delivery a strong sales point in getting orders, mills are stocking hot-rolled bands for speedier service on buyer requests.

A few rush orders for June delivery of cold-rolled sheet from automotive users have helped out **Cleveland** area mills. Larger production schedules rather than price hedging are given as the reason for the buying.

Plate and Structurals — Heavy plates and shapes continue tight. Fabricators stress that reports of more plentiful supplies of structurals are merely the result of the wider variety of shapes rolled and the timing of production cycles. If a fabricator needs a certain size and shape of product and the mill is rolling it, he's in good shape. Otherwise it's a tough struggle to get supplies.

One **Cleveland** area mill has a 60-90 day backlog of light plate orders which it is working into regular sheet production schedules. Other mills there are making light plate business a regular part of production to take up the slack in sheet ordering.

Third quarter plate bookings are filling up rapidly in the **Philadelphia area.** Colorado Fuel and Iron's 160 in. sheared plate mill at Claymont, Del., will be down for three weeks in July.

West Coast customers are easing off on structural purchases, taking a wait and see attitude. The supply of wide flange beams from Eastern mills is at its best in several years.

Pipe and Tubing—Third quarter oil country production is fully booked at one **Pittsburgh** mill with a sizable carryover expected into the fourth quarter.

Bar—Mills chasing what business exists are relying on fast delivery to nail down orders. In addition, some cold finishers are juggling the product mix to suit customer needs, running wider assortments of products in shorter batches.

July rolling schedules are about half full for one major **Cleveland** producer with little hope of expanding them. Mills in that area hope for an August pick-up as steel for the new model cars goes on the books.

June delivery is being accepted on some types of hot-rolled bar at **Pittsburgh.**

Iron Ore—Seasonal hauling is running behind last year's rate but should overtake the 1956 total in July. Last year during that month the boats were strikebound. Total for 1957 so far in the Lake Superior district is 21 million tons as compared with 22.2 million tons at the same time last year.

PURCHASING AGENT'S CHECKLIST

Second Half Outlook: Metalworking markets will tighten. **P. 51**

Behind the unexpected surge in steel scrap prices. **P. 55**

What you can do about oncoming price rises. **P. 67**

No strain in buying abrasives. Competition assures good service. **P. 144**

Prices Continue On the Upgrade

Rebounding continues to defy seasonal rules.

Mills pay higher prices to bring out the needed scrap. Export may rise.

▪ The acute shortage of scrap in many markets continues to haunt the steel mills.

As a result, prices continued their upswing in most markets, although at a rate that indicates some of the steam may be coming out of the market.

In areas where prices are strong enough to pull out the scrap, prices are already tending to level. But dealers continue to hold in some areas, particularly in the Midwest, with resulting higher prices.

General opinion is that mills stayed out of the market long enough to dry up scrap sources. Now, they are paying higher than anticipated to draw it out.

Scrap Exports to the European Coal and Steel Community from this country will be up at least 10 pct this year, perhaps more.

Government officials, attempting to reach a "gentlemen's agreement" with the ECSC, are offering to permit Western European countries to buy 10 pct more steelmaking grades in this country in 1957. U. S. officials are having trouble because of European dissatisfation over Japanese actions last year in which scrap purchases exceeded its voluntary quota.

Principally based on a sharp upturn in Chicago, and a mild rise in Pittsburgh, THE IRON AGE Composite price rose to $56.17 from last week's level of $54.83.

Pittsburgh—Prices of openhearth scrap are up $1 for No. 1 heavy melting and $2 for No. 2. The latest advances came after broker attempts to buy at several dollars below the mill price failed to produce shipments. Broker bidding quickly moved up, but the mills are still not getting shipments in sufficient quantity. Collections have improved, but the yards are slow to part with scrap. The area is still shy of scrap, but part of the deficit may be represented by stocks being held for higher prices.

Chicago—There are glimmerings that the strong holding action by major mill buyers is beginning to affect the outlook. Talk of a price slip is heard more frequently. This does not affect the current feverish activity. No. 1 heavy melting has moved at $55, yet broker buying at over this figure is reported.

Philadelphia—This market continues strong. Contributing is a very active export market. While steelmaking, blast furnace and cast iron grades remain unchanged, increases were registered for electric furnace grades and railroad specialties.

New York—Steelmaking grades continue to show strength in this area, with prices up $1. Turnings and cast, with the exception of clean cast chemical borings, are unchanged. Clean cast chemical borings rose $1 on a purchase by a large consumer. Foundry grades are reflecting seasonal slack in foundry business.

Detroit—In the absence of new orders for representative tonnages, the sharp price rise has been halted this week. However, there is underlying strength for all grades except foundry scrap and stainless. A significant development here: the strong upward trend in prices has brought out strong amounts of scrap. Meanwhile, volume of industrial scrap may be off significantly in some plants.

Cleveland—The market slowed to a walk although better prices are bringing in slightly more scrap. Lower production, plant vacations and hot weather will offset much of this. Best tip-off for summer activity appears to be auto lists closing next week. Cut structural and plates, 2 ft and under was incorrectly quoted in June 13 issue. Correct price was $58 to $59.

St. Louis—Prices of scrap continue to increase in an attempt to stimulate movement into this market. Receipts have not been sufficient to meet demand and mills were forced to increase prices.

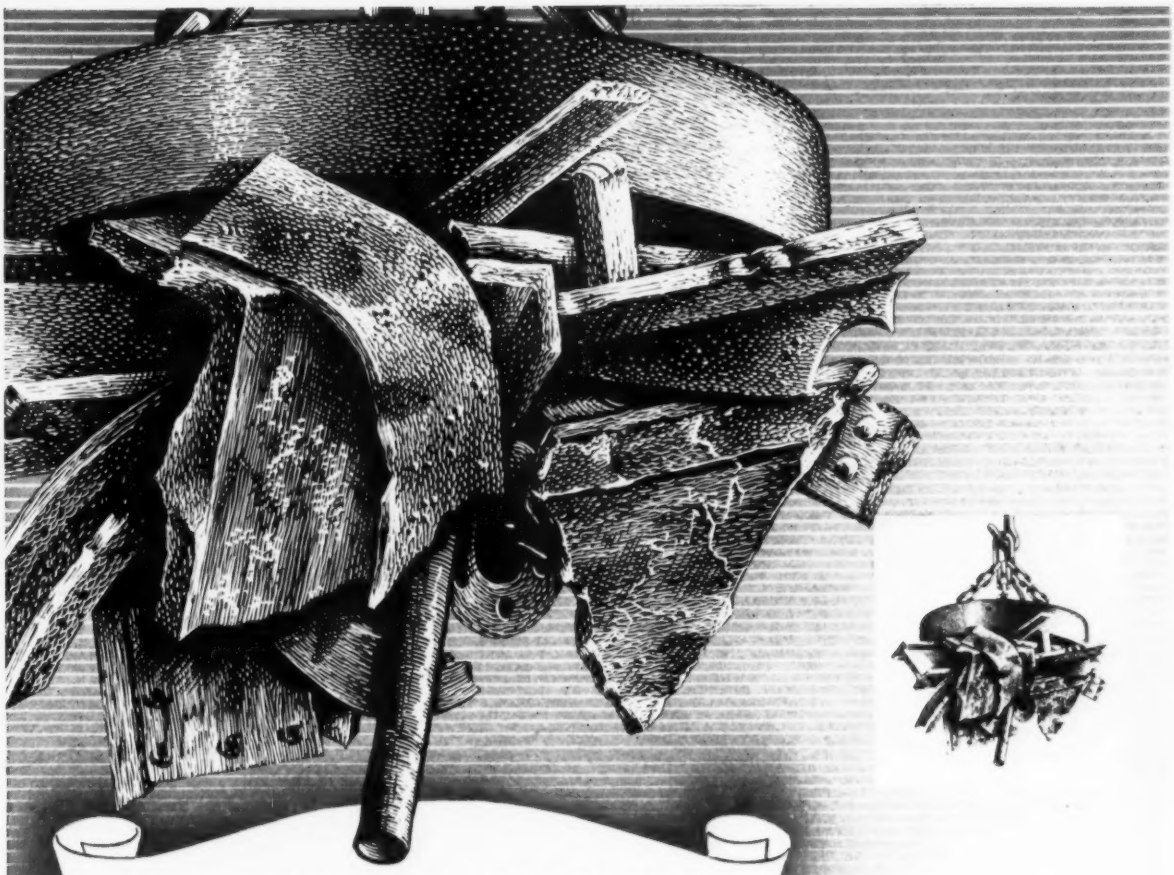
Birmingham—Scrap is beginning to come into dealers' yards a little more freely, but it is not sufficient to meet demand. Brokers in some instances are paying more than they are getting to cover old orders.

Cincinnati—Market activity is very slow, but more scrap is moving because of higher prices. Secondary grades and turnings are strong.

Buffalo — Some cast grades jumped significantly on the basis of sales, with No. 1 cupola soaring $4. Otherwise, the market appears to be quiet, with prices steady.

Boston—The market is very active here. Eastern Pennsylvania mills have come into the market for extensive tonnages and business is generally brisk. New orders confirmed higher price levels for primary grades and upward adjustments in other grades occurred this week.

West Coast—Prices are holding steady in Los Angeles, San Francisco, and Seattle. Scrap continues to flow at a snail's pace. Mills hope to finish out the month on their inventories.



A SYMBOL OF LEADERSHIP IN IRON & STEEL SCRAP SINCE 1889

Luria Brothers and Company, Inc.

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PHILADELPHIA NATIONAL BANK BLDG.

Philadelphia 7, Penna.

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DETROIT (ECORSE), MICHIGAN
PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILLINOIS
CINCINNATI, OHIO
CLEVELAND, OHIO
DETROIT, MICHIGAN
HOUSTON, TEXAS
KOKOMO, INDIANA
LEBANON, PENNA.
LOS ANGELES, CAL.
MEMPHIS, TENN.
NEW YORK, N. Y.
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EXPORTS-IMPORTS **LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

SCRAP PRICES *(Effective June 18, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	52.00 to 53.00
No. 1 dealer bundles	57.00 to 58.00
No. 1 factory bundles	62.00 to 63.00
No. 2 bundles	49.00 to 50.00
No. 1 busheling	57.00 to 58.00
Machine shop turn.	35.00 to 36.00
Mixed bor. and ms. turn.	35.00 to 36.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Low phos. punch'gs plate	62.00 to 63.00
Heavy turnings	53.00 to 54.00
No. 1 RR. hvy. melting	61.00 to 62.00
Scrap rails, random lgth.	69.00 to 70.00
Rails 2 ft and under	70.00 to 71.00
RR. steel wheels	69.00 to 70.00
RR. springs steel	69.00 to 70.00
RR. couplers and knuckles	69.00 to 70.00
No. 1 machinery cast.	56.00 to 57.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	45.00 to 46.00

Chicago

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 dealer bundles	54.00 to 55.00
No. 1 factory bundles	58.00 to 60.00
No. 2 bundles	43.00 to 45.00
No. 1 busheling	53.00 to 54.00
Machine shop turn.	36.00 to 37.00
Mixed bor. and turn.	36.00 to 37.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Low phos. forge crops	63.00 to 64.00
Low phos. punch'gs plate	59.00 to 60.00
Low phos. 3 ft and under	57.00 to 58.00
No. 1 RR. hvy. melting	60.00 to 61.00
Scrap rails, random lgth.	70.00 to 71.00
Rerolling rails	77.00 to 78.00
Rails 2 ft and under	77.00 to 78.00
Locomotive tires cut	65.00 to 66.00
Cut bolsters & side frames	66.00 to 67.00
Angles and splice bars	69.00 to 70.00
RR. steel car axles	83.00 to 84.00
RR. couplers and knuckles	63.00 to 64.00
No. 1 machinery cast.	54.00 to 55.00
Cupola cast.	50.00 to 51.00
Heavy breakable cast.	48.00 to 49.00
Cast iron brake shoe	50.00 to 51.00
Cast iron wheels	57.00 to 58.00
Malleable	63.00 to 64.00
Stove plate	50.00 to 51.00
Steel car wheels	65.00 to 66.00

Philadelphia Area

No. 1 hvy. melting	$56.00 to $57.00
No. 2 hvy. melting	48.00 to 49.00
No. 1 dealer bundles	56.00 to 57.00
No. 2 bundles	48.00 to 50.00
No. 1 busheling	56.00 to 57.00
Machine shop turn.	38.00 to 39.00
Mixed bor. short turn.	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Shoveling turnings	41.00 to 42.00
Clean cast chem. borings	45.00 to 46.00
Low phos. 5 ft and under	59.00 to 60.00
Low phos. 2 ft and under	60.00 to 61.00
Low phos. punch'gs	60.00 to 61.00
Elec. furnace bundles	58.00 to 59.00
Heavy turnings	51.00 to 52.00
RR. steel wheels	65.00 to 66.00
RR. spring steel	65.00 to 66.00
Rails 18 in. and under	71.00 to 72.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	54.00 to 55.00
Cast iron car wheels	59.00 to 60.00
Malleable	61.00 to 62.00
Unstripped motor blocks	39.00 to 40.00
No. 1 machinery cast.	56.00 to 57.00

Cleveland

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	46.00 to 47.00
No. 1 dealer bundles	51.00 to 52.00
No. 1 factory bundles	56.00 to 57.00
No. 2 bundles	41.00 to 42.00
No. 1 busheling	51.00 to 52.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Cut struct'l & plates, 2 ft & under	58.00 to 59.00
Drop forge flashings	51.00 to 52.00
Low phos. punch'gs, plate	53.00 to 54.00
Foundry steel, 2 ft & under	49.00 to 51.00
No. 1 RR. heavy melting	57.00 to 58.00
Rails 2 ft and under	72.00 to 73.00
Rails 18 in. and under	73.00 to 74.00
Railroad grate bars	35.00 to 36.00
Steel axle turnings	33.00 to 34.00
Railroad cast.	56.00 to 57.00
No. 1 machinery cast.	55.00 to 56.00
Stove plate	49.00 to 50.00
Malleable	62.00 to 63.00

Youngstown

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 dealer bundles	54.00 to 55.00
No. 2 bundles	46.00 to 47.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	56.00 to 57.00

Buffalo

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 busheling	45.00 to 46.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	31.00 to 32.00
Low phos. plate	49.00 to 50.00
Scrap rails, random lgth.	56.00 to 57.00
Rails 2 ft and under	66.00 to 67.00
RR. steel wheels	53.00 to 54.00
RR. spring steel	49.00 to 50.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	50.00 to 51.00
No. 1 cupola cast.	45.00 to 46.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	46.00 to 47.00
Drop forge flashings	46.00 to 47.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs plate	43.00 to 44.00
No. 1 cupola cast.	47.00 to 48.00
Heavy breakable cast.	43.00 to 44.00
Stove plate	44.00 to 45.00
Automotive cast.	53.00 to 54.00

St. Louis

No. 1 hvy. melting	$45.50 to $46.50
No. 2 hvy. melting	43.00 to 44.00
No. 1 dealer bundles	49.00 to 50.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	30.00 to 31.00
Cast iron borings	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
No. 1 RR. hvy. melting	56.50 to 57.50
Rails, random lengths	68.00 to 69.00
Rails 18 in. and under	75.00 to 76.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	63.00 to 64.00
Std. steel car axles	74.00 to 75.00
RR. specialties	61.00 to 62.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	43.00 to 44.00
Stove plate	43.50 to 44.50
Cast iron car wheels	49.00 to 50.00
Rerolling rails	71.00 to 72.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	44.00 to 45.00
Elec. furnace, 3 ft & under	49.00 to 50.00
Machine shop turn.	25.00 to 26.00
Mixed. bor. and short turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Clean cast. chem. borings	32.00 to 33.00
No. 1 machinery cast.	42.00 to 43.00
Mixed cupola cast.	34.00 to 35.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	32.00 to 33.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$53.00 to $54.00
No. 2 hvy. melting	43.00 to 44.00
No. 2 dealer bundles	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	32.00 to 33.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast.	46.00 to 47.00
Mixed yard cast.	41.00 to 42.00
Charging box cast.	46.00 to 47.00
Heavy breakable cast.	46.00 to 47.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$48.00 to $49.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	48.00 to 49.00
No. 2 bundles	36.00 to 37.00
No. 1 busheling	48.00 to 49.00
Machine shop turn.	37.00 to 38.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	28.00 to 29.00
Electric furnace bundles	49.00 to 50.00
Elec. furnace, 5 ft & under	47.00 to 48.00
Bar crops and plate	58.00 to 59.00
Structural and plate, 2 ft	57.00 to 58.00
No. 1 RR. hvy. melting	53.00 to 54.00
Scrap rails, random lgth.	59.00 to 60.00
Rails, 18 in. and under	65.00 to 66.00
Angles & splice bars	59.00 to 60.00
Rerolling rails	66.00 to 67.00
No. 1 cupola cast.	51.00 to 52.00
Stove plate	49.00 to 50.00
Charging box cast.	34.00 to 35.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	43.00 to 44.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	28.00 to 29.00
Low phos. 18 in. & under	54.00 to 55.00
Rails, random lengths	62.00 to 63.00
Rails, 18 in. and under	71.00 to 72.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	43.00 to 44.00
Drop broken cast.	55.00 to 56.00

San Francisco

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	47.00
No. 2 bundles	35.00
Machine shop turn.	32.00
Cast iron borings	32.00
No. 1 RR. hvy. melting	48.00
No. 1 cupola cast.	53.00

Los Angeles

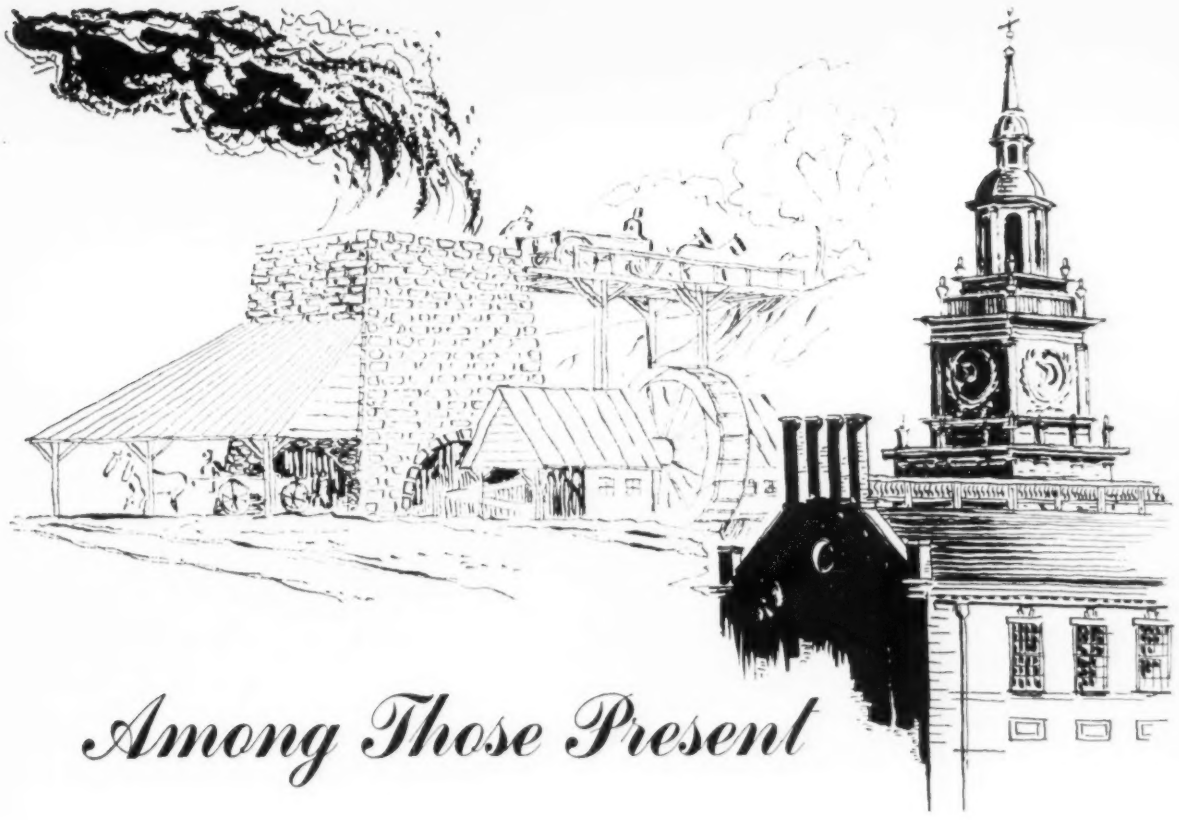
No. 1 hvy. melting	$46.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	45.00
No. 2 bundles	33.00
Machine shop turn.	32.00
Shoveling turnings	34.00
Cast iron borings	31.00
Elec. furn. 1 ft and under (foundry)	57.00
No. 1 RR. hvy. melting	46.00
No. 1 cupola cast.	$52.00 to 53.00

Seattle

No. 1 hvy. melting	$46.00
No. 2 hvy. melting	42.00
No. 2 bundles	$28.00 to 30.00
No. 1 cupola cast.	47.00
Mixed yard cast.	47.00

Hamilton, Ont.

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	40.00
No. 1 dealer bundles	45.00
No. 2 bundles	34.00
Mixed steel scrap	42.00
Busheling	36.00
Bush., new fact., prep'd.	45.00
Bush., new fact., unprep'd	39.00
Machine shop turn.	22.00
Short steel turn.	30.00
Mixed bor. and turn.	24.00
Rails, rerolling	56.00
Cast scrap	52.00



Among Those Present

Of the 56 signers of the Declaration of Independence, four were ironmasters: George Taylor, of the Durham furnace, Bucks County, Pa.; Stephen Hopkins, of the Hope furnace, in Rhode Island; James Smith, who owned the works later known as Codorus forge, in York county, Pa.; and George Ross, a lawyer of Lancaster, Pa., who was interested in the Mary Ann furnace, the first blast furnace west of the Susquehanna.

Twenty-four men identified with the iron industry were prominent officers in Washington's Army.

Thus, from its beginnings, the United States has depended upon its men of iron for leadership—and upon a continuous flow of ferrous metals for the nation's preservation and expansion.

To maintain supplies of iron and steel to meet all needs, the flow of scrap must be uninterrupted.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M. S. KAPLAN COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Expect Price Hike For Aluminum

Outlook is for an across-the-board increase of 1¢ per lb. in aluminum price.

It will come through on August 1, when producers' costs will go up about 7 pct.

Survey indicates market is gaining strength.

■ It looks like an across-the-board price increase is in the cards for aluminum on or about August 1.

On this date production costs of aluminum producers will rise about 11½¢ per hour. About seven cents will be an automatic base wage increase called for by the contract with the United Steel Workers. The rest will be for fringe benefits and a wage study and wage structure adjustments outlined in the same agreement.

Probable Increase—It has been tradititonal for producers to pass along increased labor costs. Indications are that the price rise will be about 1¢ a lb for pig and ingot and the equivalent for all mill products. This would amount to about 4 pct, compared with a 7 pct rise in employment costs.

Meanwhile, an informal survey of the aluminum industry indicates a tendency toward strength in what has been a very easy market.

(1) The Big 3 producers have the right to "put" a certain amount of overproduction into the stockpile, according to contracts with the government. From December 1956 to May 1957, 129,800 tons were taken by the General Services Administration honoring these agreements. More can be offered, enough to keep the market from getting too soft.

(2) One of the Big 3 says that while fabricating facilities are now operating below capacity, the backlog of orders is definitely getting bigger. This producer expects business in the third quarter to be better.

(3) Aluminum diecasters admit the market is softer this year than last. But most now say new die activity indicates a definite upturn in the third quarter.

(4) The president of a sales subsidiary of a major producer recently returned from a tour around the country, reports most of his customers say business is starting to firm after a soft first half.

(5) An independent extruder of architectural products, handling about 7 million pounds of aluminum per year, reports first half business in 1957 is up over last year, despite a soft first quarter. He expects 1957 to be a better year, for him, than 1956.

(6) An ingot maker reports the scrap market is starting to firm up a bit because of pickup in export, particularly to Germany and Japan, and less being generated as vacations approach.

(7) The world's largest smelter at Arvida, Canada, has been struck since May 17. The company is losing 1000 tons per day, much of which would have come across the border. The company reports that thus far it has been able to make deliveries on contracts out of inventory, and output of other plants. But metal is frozen in the pots at Arvida, and it will be some time, even after settlement, before any aluminum will be produced there.

(8) Kean Johnson, vice president, Reynolds Metals Co., said he expects the company's 1957 sales to rise to about $450 million from $405 million in 1956. He also expects Reynolds' earnings to go up, but not in direct proportion to sales.

Copper

At least one big copper company is interested in the new Chemetals process for making copper powder from scrap, low grade or low yield ores.

The leeching process will convert copper scrap into powder and pay the full conversion cost through recovery of zinc, lead, tin, etc., in the scrap.

Machinery From Bliss—E. W. Bliss, Salem, O., has exclusive license from patent holders, Chemetals Corp., N. Y., to make machinery for rolling powder into strip (IRON AGE, May 9, 1957, page 76). Bliss is prepared to install plants on a "turn-key" basis.

Tests, according to Robert Potter, Bliss president, show that copper strip produced by the new process, has tensile and deep drawing properties superior to strip made from electrolytic copper.

Tin prices for the week: June 12—98.50; June 13—98.50; June 14—98.25; June 17—98.25; June 18—98.125.*

*Estimate

Primary Prices

cents per lb	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	32.00	34.00	2/18/57
Copper (CS)	30.00	30.50	5/9/57
Copper (L)	32.00	34.00	2/19/57
Lead, St. L.	13.80	14.80	6/11/57
Lead, N. Y.	14.00	15.50	6/11/57
Magnesium ingot	36.00	34.09	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	200-250	250-275	6/6/57
Zinc, E. St. L.	11.00	11.50	6/4/57
Zinc, N. Y.	11.50	12.00	6/4/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig. Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 152.

Progress with **TITANIUM**

HEAT TREATED TITANIUM

...helps the Hustler spread its wings

The Plane: The U.S. Air Force's delta-winged B-58 Hustler, made by Convair —Fort Worth. To achieve supersonic speeds, designers had to make optimum use of all materials, considering strength, weight, high temperature performance.

The Improvement: 6Al-4V titanium alloy, furnished by Mallory-Sharon, was used in certain applications as a direct substitution for steel for wing fittings bearing heavy loads. This alloy, weighing 44% less than steel, has equal or superior strength for the heat-treated conditions.

The Service Need: The Hustler is the first major application of a new technique that extends titanium usefulness —heat treating. The alloy material is supplied in a medium strength level which permits ease of rough machining. Then the part is heat treated and finished machined to the high strengths desired in service.

To help in this development, Mallory-Sharon service engineers recommended and assisted Convair in establishing qualified subcontractor sources. We furnished bar stock to these companies for evaluation, recommended furnace type, conditions, temperatures, and heating times. We performed mechanical and chemical tests before and after heat treatment, to guide this phase of the program to a successful conclusion.

The Result: Improved performance; America's first supersonic bomber. Use Mallory-Sharon's outstanding technical service on *your* applications of this new metal. For information, write Dept. R-7.

MALLORY Ti SHARON

MALLORY-SHARON TITANIUM CORPORATION · NILES, OHIO

Producers of titanium and titanium alloy sheet, strip, plate, rod, bar, billets

NONFERROUS MARKETS *(Effective June 18, 1957)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1800, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.4	57.6-61.1
12-14	43.4-44.8	58.4-62.7
24-26	46.4-46.9	68.7-78.1
36-38	54.8-55.4	91.5-94.9

Screw Machine Stock—2011-T-3

Size"	¼	⅝-⅞	¾-1	1¼-1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.010 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	108.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13		51.36	54.32
Brass, 70/30	46.85	47.39	46.75	49.76
Brass, Low	49.80	50.34	49.74	52.61
Brass, R L	50.84	51.38	50.78	53.65
Brass, Naval	50.91		45.22	54.32
Muntz Metal	48.99		44.80	
Comm. Bz.	52.43	52.97	52.37	54.99
Mang. Bz.	54.65		48.75	
Phos. Bz. 5%	73.17		73.67	

Free Cutting Brass Rod 34.97

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00; Bar, HR or forged, commercially pure, $6.15-6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots $2.25
Cadmium, del'd $1.70
Calcium, 99.9%, small lots $4.55
Chromium, 99.8% metallic basis ... $1.31
Cobalt, 97-99% (per lb) .... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $39.50-$53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz... $2.25
Iridium, dollars per troy oz.... $90 to $100
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz.... $92 to $95
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.250
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium $3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 30.50
No. 120 ..... 29.25
No. 123 ..... 27.50
80-10-10 ingot
No. 305 ..... 34.50
No. 315 ..... 32.50
88-10-2 ingot
No. 210 ..... 42.25
No. 215 ..... 38.50
No. 245 ..... 34.50
Yellow ingot
No. 405 ..... 25.00
Manganese bronze
No. 421 ..... 28.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.00-24.75
0.60 copper max. 23.75-24.50
Piston alloys (No. 122 type)... 22.50-24.50
No. 12 alum. (No. 2 grade)... 20.50-22.00
108 alloy 21.00-22.00
195 alloy 23.50-25.00
13 alloy (0.60 copper max.)... 23.75-24.50
AXS-679 ..... 21.00-22.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 22.00-22.75
Grade 2—92-95% 20.50-21.50
Grade 3—90-92% 19.50-20.50
Grade 4—85-90% 18.75-19.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28	27¼
Yellow brass	21¼	19¾
Red brass	24¾	24
Comm. bronze	25¾	25
Mang. bronze	19¾	19
Yellow brass rod ends	21	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 25½
No. 2 copper wire 23¾
Light copper 21¼
*Refinery brass 23¼
Copper bearing material 23
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 25½
No. 2 copper wire 23¾
Light copper 21¼
No. 1 composition 23
No. 1 comp. turnings 22½
Hvy. yellow brass solids 17
Brass pipe 19
Radiators 18
Aluminum
Mixed old cast. ..... 13½—14½
Mixed new clips ..... 15 —16
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 23 —23½
No. 2 copper wire ..... 21½—22
Light copper ..... 19¾—20¼
Auto radiators (unsweated) .. 15¼—15½
No. 1 composition ..... 20 —20½
No. 1 composition turnings... 19½—20
Cocks and faucets ..... 16½—17
Clean heavy yellow brass .... 14 —14½
Brass pipe ..... 17 —17½
New soft brass clippings .... 18 —18½
No. 1 brass rod turnings .... 15½—15¾

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 13½—14
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10¾—11
2024 (24S) Clippings ..... 12 —13½

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾ — 2
Old die cast scrap ..... 1¾ — 2

Nickel and Monel

Pure nickel clippings 85-90
Clean nickel turnings 70-75
Nickel anodes 85-90
Nickel rod ends 85-90
New Monel clippings 45-48
Clean Monel turnings 35-40
Old sheet Monel 44-45
Nickel silver clippings, mixed. 21
Nickel silver turnings, mixed. 18

Lead

Soft scrap lead ..... 9½—10
Battery plates (dry) ..... 4¼— 4½
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 15½—16
Siphon tops 42
Small foundry type ..... 13 —13¼
Monotype ..... 13 —13¼
Lino. and stereotype ..... 12 —12¼
Electrotype ..... 11 —11¼
Hand picked type shells ..... 8 — 8½
Lino. and stereo. dross ..... 3¾— 4
Electro. dross ..... 3 — 3¼

PYRAMID TYPE PLATE BENDING ROLL

Capacity 1¼" X 12'

Our Line

Light and heavy machinery for all classes of sheet metal, plate and structural work.

BERTSCH & COMPANY, CAMBRIDGE CITY INDIANA

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MATERIALS

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Sources for every need in the Metalworking industry

The IRON AGE

Formed steel bridge rails

WE HAVE STEEL AND PRESSES --- for making these sections in lengths up to 20'..... steel up to ½" thick!

MAY WE BID ON YOUR REQUIREMENTS

HARRISON SHEET STEEL CO.

4718 W. FIFTH AVENUE CHICAGO 44

WILLIAMS-WHITE C-FRAME PUNCHES and SHEARS

Custom Built to Your Requirements

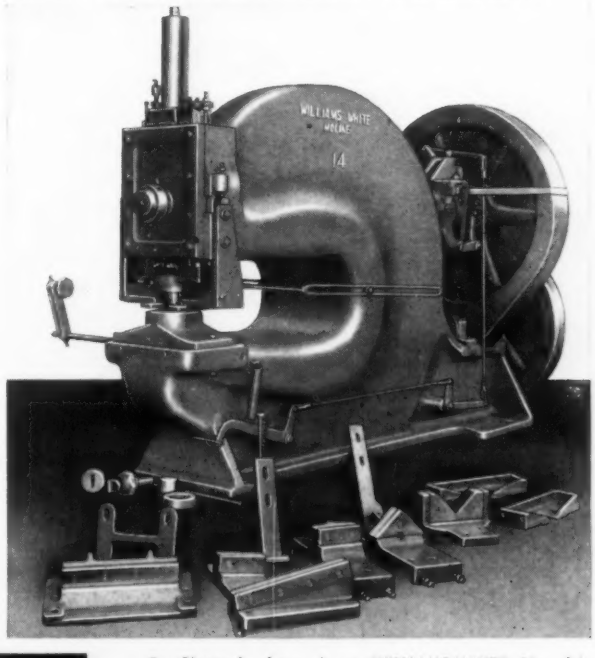
- **Bronze bushed main shaft bearings**
- **Anti-Friction flywheel bearings**
- **Renewable liners in ram pocket**
- **Jaw or friction clutches**
- **Footbutton or treadle control**

Above are some of the features built into C-frame Punches and Shears by WILLIAMS-WHITE & CO. They are regularly built in various capacities and throat depths, either single or double end and with plain or architectural type tables. Frames may be either cast semi-steel, of box section, or of steel plate, welded construction.

REPRESENTATIVES

CALIFORNIA, Los Angeles: George A. Davies Mach'y Co.
ILLINOIS, Chicago: WILLIAMS-WHITE & CO., 53 W. Jackson Blvd.
MICHIGAN, Detroit: E. E. Wood Mach'y Co.
OHIO, Cincinnati: Columbus or Dayton: Seifreat-Elstad Mach'y Co.
Cleveland: A. L. Bechtel & Son
OREGON, Portland: Allied Northwest Mach. Tool Corp.
PENNSYLVANIA, Pittsburgh: Frank Ryman's Sons
Wynnewood (Phila.): Edw. A. Lynch Mach'y Co.
WASHINGTON, Seattle: Perine Mach'y & Supply Co.
WISCONSIN, Milwaukee: Pagel Mach'y Co.

BUILDERS OF MACHINERY SINCE 1854



- Pictured above is a WILLIAMS-WHITE No. 14, Single End Punch of 100 tons capacity, 36-inch throat, with standard punching, angle, plate and bar shearing tools.

For complete details, ask for Bulletin 74

WILLIAMS-WHITE & Co.

302 EIGHTH ST. • MOLINE, ILLINOIS

PRESSES • BULLDOZERS • BENDERS • PUNCHES • SHEARS

COMPARISON OF PRICES

(Effective June 18, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type:** declines appear in *Italics.*

	June 18 1957	June 11 1957	May 21 1957	June 19 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.28
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	50.00	50.00	50.00	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	43.25	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.60¢
Rails: (per 100 lb.)				
Heavy rails	$5.275	$5.275	$5.275	$4.725
Light rails	6.25	6.25	6.25	5.65
Semifinished Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging, billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.625	4.625	4.625	4.225
Finished Steel Composite: (per pound)				
Base price	5.670¢	5.670¢	5.670¢	5.179¢

	June 18 1957	June 11 1957	May 21 1957	June 19 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$68.88	$68.88	$68.88	$65.26
Foundry, Valley	65.00	65.00	65.00	60.50
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	65.00	65.00	65.00	60.50
Basic, del'd Philadelphia	68.38	68.38	68.38	64.48
Basic, Valley furnace	64.50	64.50	64.50	60.00
Malleable, Chicago	65.00	65.00	65.00	60.50
Malleable, Valley	65.00	65.00	65.00	60.50
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	12.75¢	12.75¢	12.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$64.56	$64.56	$64.56	$60.29
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$57.50	$56.50	$46.50	$44.50
No. 1 steel, Phila. area	56.50	56.50	51.50	46.50
No. 1 steel, Chicago	54.50	51.50	43.50	43.50
No. 1 bundles, Detroit	46.50	46.50	39.00	37.50
Low phos., Youngstown	56.50	56.50	45.50	48.50
No. 1 mach'y cast, Pittsburgh	56.50	56.50	54.50	54.50
No. 1 mach'y cast, Philadel'a	56.50	56.50	56.50	54.50
No. 1 mach'y cast, Chicago	54.50	54.50	47.00	48.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$56.17	$54.83	$47.17	$44.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	32.00	32.00	32.00	46.00
Copper, Lake, Conn.	32.00	32.00	32.00	46.00
Tin, Straits, New York	98.125†	98.125*	97.75	94.625
Zinc, East St. Louis	11.00	11.00	11.50	13.50
Lead, St. Louis	13.80	13.80	14.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	25.90
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	34.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 158→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	66.50	67.00	67.50	68.00	...
Birmingham *R3*	58.50	59.00*	...	...	...
Birmingham *W9*	58.50	59.00*	63.00	...	...
Birmingham *U4*	58.50	59.00*	63.00	...	...
Buffalo *R3*	64.50	65.00	65.50	66.00	...
Buffalo *H1*	64.50	65.00	65.50	66.00	...
Buffalo *W6*	64.50	65.00	65.50	66.00	...
Chester *P2*	66.50	67.00	67.50	...	...
Chicago *I4*	64.50	65.00	65.00	65.50	...
Cleveland *A5*	64.50	65.00	65.00	65.50	69.50†
Cleveland *R3*	64.50	65.00	65.00	65.50	...
Duluth *I6*	64.50	65.00	65.00	65.50	69.50†
Erie *I4*	64.50	65.00	65.00	65.50	69.50†
Everett *M6*	66.00	66.50	67.00	...	...
Fontana *K1*	72.50	73.00	...	...	...
Geneva, Utah *C7*	64.50	65.00	...	...	...
Granite City *G2*	66.40	66.90	67.40	...	...
Hubbard *Y1*	...	...	65.00	...	...
Ironton, Utah *C7*	64.50	65.00	...	...	...
Midland *C11*	64.50	...	...	...	...
Minnequa *C6*	66.50	67.00	67.50	68.00	...
Monessen *P6*	64.50	...	...	...	...
Neville Is. *P4*	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda *T1*	...	65.00	65.50	66.00	...
Sharpsville *S1*	64.50	65.00	65.00	65.50	...
So. Chicago *R3*	64.50	65.00	65.00	...	...
Swedeland *A2*	66.50	67.00	67.50	68.00	...
Toledo *I4*	64.50	65.00	65.00	65.50	...
Troy, N. Y. *R3*	66.50	67.00	67.50	68.00	72.50
Youngstown *Y1*	...	...	65.00	65.50	...

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31 0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $78.50; Jackson, *J1, I4* (Globe Div.), $77.25; Niagara Falls 15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	39.25	40.25-40.50	41.00-41.25	44.00	43.75	66.75-67.00	50.50-51.00	59.25-59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*, Brackenridge, Pa., *A5*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*, New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*, New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5, R3*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Harrison, N. J., *D3*; Baltimore, *A7*, Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*, Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*, Watervliet, *A3*, Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

STEEL PRICES

(Effective June 18, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3, W8*	$107.00 *U1, R3, W8*	5.90 *U1*	5.00 *U1, W8* 5.00 *P13*	7.35 *U1, Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1, T8* 6.95 *M8*			7.75 *W8, S9*	14.55 *A1, S4, T8*
	Cleveland, Ohio									6.85 *A5, J3*			7.75 *J3*	
	Detroit, Mich.			$107.00 *R3*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, D2*	7.75 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1, I3*	5.25 *I3*	4.675 *U1, I3, Y1*	6.85 *Y1*	6.95 *U1, I3, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*				5.00 *N4*			4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.												7.75 *A4*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1*	$91.50 *U1, C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3, B4, S2*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*			7.35 *Y1*			6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.75 *K1*	8.10 *K1*	5.90 *K1*	5.525 *K1*	8.70 *K1*				
	Geneva, Utah		$91.50 *C7*			5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B3*		5.425 *B2, C7*	8.90 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.					5.20 *A8*			4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.00 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10* 4.675 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

IRON AGE

STEEL PRICES

(Effective June 18, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollaware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8,K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$10.05 *J3, U1*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.30 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W5, W5*	5.75 *W5, W5,F3*	6.30 *W5, W5*		6.70 *W5, W5*	6.90 *W3*	8.525 *W3*				$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.30 *Y1*			
WEST	Fontana, Cal.	5.525 *K1*	7.00 *K1*				7.75 *K1*	9.775 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.60 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	.575 *T2*	6.30 *T2, R3*							5.80 *T2,R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.05 *S2*			

STEEL PRICES

(Effective June 18, 1957)

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B3*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.70 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.95 *A2*	5.925 *A2*	6.85 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Mass.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.625 *A5* 8.625 *B5*						7.50 *A5,W6* 9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,A9*		6.85 *A9*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2, T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.075 *P13*	5.075 *U1,R3, N4* 5.075 *P13*	6.85 *A5,B5, W10,L2 W8,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9 W10*	5.875 *W8* 7.425 *U1*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5,K2, R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.175 *N4*	5.175 *N4*					4.85 *N4*				7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3,R3,S9, B4,W10,C11*	6.125 *U1, C11,J3*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W3*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1* 7.25 *U1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J3*	5.825 *J3*									
	Fontana, Cal.	5.775 *K1*	5.775 *K1*		7.175 *K1*		8.125 *K1*	5.60 *K1*		7.60 *K1*	8.00 *K1*	
	Geneva, Utah							4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3,P14*	7.175 *B2*	10.20 *P14*	8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2* 6.025 *P9*	5.775 *C7* 5.825 *B2* 6.025 *P9*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2, N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.275 *A8*	5.275 *A8*									7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.075 *C16*	5.075 *T2,R3* 5.075 *C16*	7.45 *C16*			7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

†Merchant Quality—Special Quality .35¢ higher.

STEEL PRICES *(Effective June 18, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal	Blk.	Gal.
Sparrows Pt. *B3*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Youngstown *R3*	9.25	+10.00	12.25	+6.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fontana *K1*	+3.75	+19.00	+0.75	+15.00	2.75	+10.50	5.25	+9.75	5.75	+8.75	6.25	+8.25	7.75	+8.50								
Pittsburgh *J3*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50	5.25	+20.25	1.25	+15.50	3.75	+13.00	5.25	+11.50
Alton, Ill. *L1*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Sharon *M5*	9.25	+10.00	12.25	+2.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fairless *N2*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Pittsburgh *N1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50	5.25	+20.25	1.25	+15.50	3.75	+13.00	5.25	+11.50
Wheeling *W5*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50								
Wheatland *W4*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50								
Youngstown *Y1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50	5.25	+20.25	1.25	+15.50	3.75	+13.00	5.25	+11.50
Indiana Harbor *Y1*	8.25	+9.00	13.25	+2.00	14.75	1.50	17.25	2.25	17.75	3.25	18.25	3.75	19.75	4.25								
Lorain *N2*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	4.50	5.25	+20.25	1.25	+15.50	3.75	+13.00	5.25	+11.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Youngstown *R3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Fairless *N2*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Fontana *K1*	0.75		4.75		7.75		8.25		8.75		9.25		9.75									
Pittsburgh *J3*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+9.50	11.25	+4.50
Alton, Ill. *L1*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon *M5*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Pittsburgh *N1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+9.50	11.25	+4.50
Wheeling *W5*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Wheatland *W4*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Youngstown *Y1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+9.50	11.25	+4.50
Indiana Harbor *Y1*	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50								
Lorain *N2*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+9.50	11.25	+4.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium .83 D-3, D-5
Oil hardened manganese .45 O-2
Special carbon .41 W-1
Extra carbon .345 W-1
Regular carbon .29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (A3, J2, L4) 10 pct	15 pct	20 pct	Sheet (I2) 20 pct
	302				35.50
	304	36.20	40.30	44.50	37.75
	316	41.60	45.90	50.15	55.50
	321	37.95	42.10	46.40	44.75
	347	41.25	46.45	51.70	54.25
	405	29.20	33.15	37.05	
	410, 430	28.70	32.65	36.55	

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85; 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	9.80	9.20	
Armature	10.35	10.35	10.85
Elect.	11.80	11.025	11.525
Meter	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60		
		Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	167	181		195	187	8.10	8.50
Aliquippa, Pa. *J3***	164	179			181	8.20	8.875
Atlanta *A2***	166	182		192	190	8.05	8.65
Bartonville *K2***	166	182		198	190	8.30	9.06
Buffalo *W6*						8.20	8.75
Chicago, Ill. *N4***	164	180	167	196	188	8.35	9.10
Cleveland *A6*	173					8.20	8.75
Cleveland *A5*						8.20	
Crawfordsville *M4***	166	182		198	190	8.30	9.05
Donora, Pa. *A5*	164	176		196	184	8.20	8.75
Duluth *A5*	164	176	167	196	184	8.20	8.75
Fairfield, Ala. *T2*	164	176		196	184	8.20	8.75
Galveston *D4‡*	169						
Houston *S2*	169	181		195	189	8.45	9.00
Johnstown, Pa. *B3***	164	180	167		188	8.20	8.90
Joliet, Ill. *A5*	164	176		196	184	8.20	8.75
Kokomo, Ind. *C9**	166	178		198	186	8.30	8.85
Los Angeles *B2****						9.15	9.90
Kansas City *S2**	169	181		195	189	8.45	9.00
Minnequa *C6†*	169	181	172	201	189	8.45	9.00
Monessen *P6*	167	185			191	8.10	8.10
Palmer, Mass. *W6*						8.50	9.05
Pittsburg, Cal. *C7*	183	199		220	204	9.15	9.70
Rankin, Pa. *A5*	164	176			184	8.20	8.75
So. Chicago *R3*	167	181		195	187	8.10	8.50
S. San Francisco *C6†*				220		9.15	9.70
Sparrows Pt. *B3****	166			198	190	8.30	9.00
Struthers, O. *Y1**						8.20	8.85
Worcester *A5*	170					8.50	9.05
Williamsport, Pa. *S5*			175				

* Zinc less than .10¢ ‡ Plus zinc extras.
** 11-12¢ zinc. † Wholesalers only.
*** .10¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 0.40	0.41 0.60	0.61 0.80	0.81 1.05	1.06 1.35
Baltimore, Md. *T8*	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*		10.40	12.60	15.60	18.55
Boston *T8*	9.20	10.40	12.60	15.60	18.55
Buffalo, N. Y. *R7*	8.65	10.10	12.30	15.30	18.25
Carnegie, Pa. *S9*	8.65	10.10	12.30	15.30	
Cleveland *A5*	8.65	10.10	12.30	15.30	18.25
Detroit *D1*	8.75	10.20	12.40	15.40	
Detroit *D2*	8.75	10.20	12.40		
Dover, O. *G4*	8.65	10.10	12.30	15.30	18.25
Evanston, Ill. *M8*	8.65	10.10	12.30		
Franklin Park, Ill. *T8*	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. *C11*			12.60	15.60	18.55
Indianapolis *C5*	8.80	10.25	12.30	15.30	18.25
Los Angeles	10.85	12.30	14.50		
New Castle, Pa. *B4*	8.65	10.10	12.30	15.30	
New Haven, Conn. *D1*	9.10	10.40	12.60	15.60	
Pawtucket, R. I. *N7*	9.20	10.40	12.60	15.60	18.55
Pittsburgh *S7*	8.65	10.10	12.30	15.30	18.25
Riverdale, Ill. *A1*	8.75	10.10	12.30	15.30	18.25
Sharon, Pa. *S1*	8.65	10.10	12.30	15.30	18.25
Trenton *R4*	11.05	10.40	12.60	15.60	18.55
Wallingford *W1*	9.10	10.40	12.60	15.60	18.45
Warren, Ohio *T4*	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. *A5*	9.20	10.40	12.60	15.60	18.55
Youngstown *C5*	8.65	10.10	12.30	15.30	18.25

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
National Tube	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
Pittsburgh Steel	2	13	36.34	42.56		
	2½	12	48.94	57.31		
	3	12	56.51	66.18		
	3½	11	65.97	77.25		
	4	10	87.61	102.59		

WAREHOUSES

Metropolitan Price, dollars per 100 lb

City	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Hot-Rolled (special quality)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.17	9.37	9.83	8.21	8.55	8.59	8.45		10.23				
Baltimore	$.10	7.98	9.08	9.31	8.46	8.36	8.85	8.53		9.13	14.99	14.44	18.39	18.09
Birmingham	.15	7.80	9.00	9.52	7.82	8.16	8.20	8.07	8.44	10.04 10.12				
Boston	.10	8.94	9.98	11.06	8.99	9.28	9.20	9.17	9.57		15.79	14.79	19.14	18.39
Buffalo	.15	8.00	9.15	10.83	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.65	19.01	18.25
Chicago	.15	7.95	9.15	9.80	7.97	8.31	8.35	8.22	8.50	8.50	15.30	14.30	18.65	17.90
Cincinnati	.15	8.09	9.20	9.80	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	18.21
Cleveland	.15	7.93	9.13	9.70	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	17.99
Denver		9.70	11.30	12.49	9.80	9.70	9.80	9.95		10.65				17.60
Detroit	.15	8.18	9.40	10.15	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston		8.80	9.75		7.75	8.80	8.00	8.05		10.65	15.50		19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	8.83	8.87	8.73		9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.20	10.90	11.35	9.25	9.75	9.25	9.10	9.30	12.20	16.45	15.60	20.30	19.70
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25		9.85				
Milwaukee	.15	8.08	9.28	9.93	8.10	8.44	8.56	8.35	8.71	8.72	15.43	14.43	18.78	18.03
New York	.10	8.55	9.76	10.31	9.00	9.11	9.01	9.11	9.48		15.02	14.69	18.42	18.29
Norfolk	.20	8.80			8.40	8.35	8.70	8.45		10.70				
Philadelphia	.10	8.25	9.17	10.34	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh	.15	7.93	9.14	10.15	8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	17.90
Portland		9.20	11.20	11.55	11.05	9.00	9.35	9.35		13.80	16.70	16.10	20.40	20.25
San Francisco	.10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.40	16.45	15.60	20.30	19.70
Seattle		9.55	10.70	11.60	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	19.45
Spokane	.15	9.70	10.85	11.75	9.70	9.45	9.50	9.65	10.00	13.55		16.75		20.35
St. Louis	.15	8.29	9.49	10.16	8.34	8.67	8.82	8.58	9.11	9.11	15.66	14.66	19.01	18.26
St. Paul	.15	8.39	9.59	10.26	8.43	8.99	8.94	8.53		9.21		14.62		18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
†16 gage. ††13½¢ zinc. ‡Deduct for country delivery.

(Effective June 11, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.275	6.25	6.60				
Cleveland							13.85
So. Chicago *R3*				9.225			
Enaley *T2*	5.275	6.25					
Fairfield *T2*		6.25		9.225		6.275	
Gary *U1*	5.275					6.275	
Huntington *C16*		6.25					
Ind. Harbor *I3*	5.275		6.60	9.225		6.275	
Ind. Harbor *Y1*				9.225			
Johnstown *B3*		6.25					
Joliet *U1*			6.60				
Kansas City *S2*				9.225			13.85
Lackawanna *B3*	5.275	6.25	6.60			6.275	
Lebanon *B3*							13.85
Minnequa *C6*	5.275	6.75	6.60	9.225		6.275	13.85
Pittsburgh *P5*							13.85
Pittsburgh *J3*				9.225			
Seattle *B2*				9.725		6.425	13.85
Steelton *B3*	5.275		6.60			6.275	13.85
Struthers *Y1*				9.225			
Torrance *C7*						6.425	
Williamsport *S5*		6.15					
Youngstown *R3*				9.225			

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b. oven)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	29.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unbored.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	47.92
Electrodeposited	38.25
Brass, 80-20, ball anodes, 2000 lb or more	50.00
Zinc, ball anodes, 2000 lb lots	21.25
(For elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.07 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.80
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	49.50
Nickel chloride, freight allowed, 200 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 100,000 lb or more	31.00

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Pct Discounts: Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	52½	56½	58½	59½
⅝" thru 1" x longer than 6"	43½	47½	50	51½
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	52½	56½	58½	59½
Lag, all diam. x 6" & shorter	52½	56	58	59
Lag, all diam. longer than 6 in.	44½	48	50	51
Plow bolts, ½" and smaller x 6" and shorter	52	55½	57	58

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.

	Full Case or Keg Price
¾ in. or smaller	61½
⅞ in. to 1 in. inclusive	57½
1⅛ in. to 1½ in. inclusive	62½
1⅝ in. and larger	56

C. P. Hex reg. & hvy.

¾ in. and smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

Hot Galv. Nuts (All Types)

¾ in. and smaller	48

Semi-finished Hex Nuts

¾ in. or smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

(Add 25 pct for broken case or keg quantities)

Finished

1 in. and smaller	64

Rivets

	Base per 100 lb
½ in. and larger	$11.50
	Pct Off List
7/16 in. and smaller	23

Cap Screws

	Discount (Packages) Bright	Treated H. C. Heat
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	44	31
¾" ⅞" and 1" diam. x 6" and shorter	27	9
⅝" diam. and smaller x longer than 6"	14	+ 6
¾", ⅞", and 1" diam. & longer than 6"	½	+ 24

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	44	61
¾" through 1" dia. x 6" and shorter	27	49

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk *Quantity*		
To ¾" diam. incl. 25,000-200,000	9	54
5/16 to ½" diam. incl. 15,000-100,000	9	54
All diam. over 3" long 5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
In cartons	16	18
Quantity		
In Bulk ⅝" diam. & smaller 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.7
Chicago	134.1
San Francisco-L. A.	141.8

Dec. 1955 value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, n t ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$105.00
Standards chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard, Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, West of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East carloads	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.90
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	37.4¢ to 41.5¢
Copper, electrolytic	15.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	$1.02
Stainless steel, 316	$1.20
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 10 ton lots	18.5¢ to 21.7¢

Vibration won't loosen FLEXLOC self-locking nuts

Where products must be reliable . . . must stand up under vibration, temperature extremes and hard use . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts.

HERE'S WHY:

FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting locking action. And they are reusable: repeated removal and replacement, frequent adjustments, even rough screw threads will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes, types and materials to meet the most critical locknut requirements. Your local industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

FLEXLOC® LOCKNUT DIVISION

STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

FERROALLOY PRICES

(Effective June 18, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si... 35.50
8.50% max. C, 50-55% Cr, 3-6% Si.. 24.00
8.50% C, 50-55% Cr, 3% max. Si... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅜" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	23.70	22.40
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si	19.50	

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract, basis, per pound contained V_2O_5 ..... $1.38

Zirconium contract basis per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Boroxil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload..... $5.50

Bortam, f.o.b. Niagara Falls,

Ton lots per pound	45¢
Less ton lots, per pound...	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

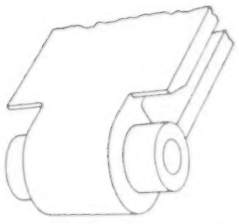
Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.15

TIGHTEN YOUR BELT ON COSTS!

SPECIFY HEAVY-DUTY THERMALLOY* CONVEYOR BELT

Designed by Electro-Alloys to eliminate the "crank-shafting" caused by extreme temperatures and heavy loading conditions. Short integral cast pin allows the link to adjust itself and transfer the load of the belt evenly to the rest of the links. Cast pin is approximately twice as strong in shear as the ordinary wrought alloy bar—and so designed that the bending stress is definitely lower than can be expected from the cast link of a conventional belt.

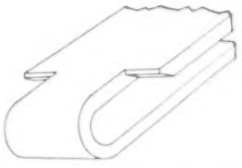


Typical heavy-duty link with cast pin.

FOR LIGHTER PARTS, SPECIFY THERMALLOY GENERAL PURPOSE

A loop-type casting design, suitable for general heat-treat applications in industry. Available in either 3″ or 4″ pitch. The 3″ pitch is a light-duty general-purpose belt, weighing 17 lbs. per sq. ft. The 4″ pitch is primarily designed for intermediate loads of somewhat larger parts, and weighs 21 lbs. per sq. ft.

*Reg. U. S. Pat. Off.



Typical 3″ or 4″ pitch center link of loop-type casting design.

WRITE FOR BULLETIN T-241

. . . giving additional design and application information on both Heavy-Duty and General-Purpose Thermalloy Conveyor Belts. Address: Electro-Alloys Division, 8016 Taylor St., Elyria, Ohio.

AMERICAN Brake Shoe COMPANY **ELECTRO-ALLOYS DIVISION** ELYRIA, OHIO

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"ANYTHING containing IRON or STEEL"

Equipment Search On at New York

Used machinery dealers there continue hunt for late-model tools despite slight slacking in the sales tempo.

Shortage of quality items offsets easing in demand.

▪ New York area machinery dealers are continuing their search for good late-model tools to sell, despite a slight sales slump. The market has turned spotty, but no one is too disturbed. Overall, the man with the machine to sell can move it at a good price.

The shortage of quality tools offsets any easing in demand, at least as far as the price structure is concerned. Even if there are a few less customers for a given tool, the people who want it will pay a good price to get it.

Building Market Helps — Construction activity keeps demand for brakes, shears, ironworkers and similar items strong. This market never really slumped off, even during the winter when construction in this area was virtually halted. Demand continues to exceed supply, and dealers expect this situation to remain for some time to come.

The toolroom equipment market seems to be easing somewhat, but dealers report they still get good prices for late model machines. "There's always a market for these tools if you have good ones." But older equipment is harder to move at a good price.

What's Moving — Demand has held up well for larger presses, but there is currently less call for lighter ones. Milling machines and boring mills are moving at a good clip, and there is nice business in larger lathes. Supply of grinders appears plentiful. Cranes continue very scarce in this area.

Generally, the big problem is getting tools to sell. Today's buyer wants recent models, and dealers are reaching out into the Middle West to find them. Such out-of-geography procurement, of course, adds to the final selling price. But it is significant that New York area dealers have not yet run into the price resistance cropping up further west. Price here is not the controlling factor in a sale. Age is far more important.

On balance, the dealers expect a good summer, making allowances for vacation slowdowns. There seems to have been little curtailment of expansion plans among used tool buyers, and tight money is not proving the handicap once predicted. Customers can still find money to pay for the tools they need.

New MDNA Chairmen

The following chapter chairmen were elected for the year 1957-58 by the Machinery Dealers National Association during their annual convention: Chicago — Samuel Segal, Samson Machinery Co.; Cleveland —Willis Thomas, Price Thomas, Inc.; Delaware Valley — Stanley Laderman, Delaware Equipment Co., Phila.; Detroit—Dave Demarest, Dave Demarest & Co.; Milwaukee — E. J. Melicher, F. W. Burns Machinery Co.; N. Y.-New England — Joseph A. Feigenbaum, Abbott Machinery Co., Union City, N. J.; and St. Louis — Samuel Zimmerman, Municipal Tool & Machinery Co.

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR
450 cu. ft. Ingersoll Rand XRE, 100# Pressure
100 H.P. Westinghouse Motor 440-3/60

BENDER—PIPE
6" U. S. Pipe Bender, Titan Model

BENDING ROLLS
10' x ½" Kling Pyramid Type—LATE
16' x ¾" Ransome, Pyramid Type
27" x 1" Southwark, Pyramid Type

BRAKES—LEAF TYPE
8' x 3/16" Dreis & Krump
12' x ¼" Dreis & Krump
12' x ½" Dreis & Krump No. 228

BRAKE—PRESS TYPE
14' x ¼" Superior Hydraulic—NEW

BUILDINGS
70' x 760' x 29'
50' x 325' x 24'

BULLDOZERS
#7 Ajax, 22" Stroke, 12"x65" Face of Crosshead
#27 W & W, 22" Stroke, 16"x80" Face of Crosshead

CORRUGATING MACHINE
12" Stanco Corrugating Machine, Rolls 21" Dia.

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton Euclid	20' Span	220/3/60
5 ton Whiting	48' Span	230/3/60 A.C.
5 ton Case	59' Span	220/3/25
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	27' Span	220/3/60
10 ton Shepard Niles	58' Span	440/3/60
15 ton Shepard Niles	52' Span	230 Volt D.C.
15 ton Shepard Niles	37' Span	220/440 A.C.
15 ton Shepard Niles	55' Span	220/440 A.C.
20 ton P&H	57' Span	220/440 A.C.
25 ton Cleveland	70' Span	220/3/60
With 10 ton Auxiliary (Mill Type)		

DIEING MACHINE
60-ton Henry & Wright, Roll Feed, Scrap Cutter
1" Stroke NEW 1950

DRAW BENCH
10,000# Aetna Standard Single Draw Tube Draw Bench, 11 Ft. Max. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—ANNEALING
Lithium Atmosphere Car Type Annealing Furnace Heating Section 21' L. 11'6" W. 17' H Overall

HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING—800 lb to 20,000 lb.

LEVELERS—ROLLER
32" Torrington, 19 Roll 1-31/32" Dia. Backed up
54" McKay, 17 Rolls, 3⅝" Dia.
108" American, 17 Rolls, 4½" Dia.

PLANER—PLATE EDGE
55' Southwark, 16 Pneu. Jacks, Capy. 1½"

PRESSES—HYDRAULIC
800 ton Clearing, 48" Stroke, Bed 48 x 48"
1500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—TOGGLE DRAWING
#34½ Bliss 125 ton, Bolster 13" x 26"
#4 Bliss 170 ton, Bed Area 34" x 51"
#1018 Bliss 1500#, Die Space 60" x 72"

PRESSES—STRAIGHT SIDE
110 ton Cleveland 55D-54, 5" Stroke
Bolster 32" x 54", Air Cushion
150 ton Cleveland 65D-60, 6" Stroke
Bolster 40" x 60", Air Cushion

PUNCH & SHEAR COMBINATIONS
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
No. 1½" Buffalo Universal Ironworker

ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
10" x 14" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Farrel Two Stand Two High
26" x 72" Cold Rolling Mill
22" x 40" Three High Sheet Mill

ROLL—FORMING
11 Stand Dahlstrom, Takes widths to 8"

SHEAR—ALLIGATOR
No. 1 Mesta RH LK, Capacity 2" x 12"

SHEAR—BAR
48" Mesta Bar Shear, Capacity 4" x 35" Slabs Hot.

SHEAR—GATE
12" x ¾" Niagara Model 1212, NEW 1951

SHEAR LINES
60" Shear Line, With Leveller & Tables
96" x 14 Ga. Cleveland, With Payoff, Leveler, Elect

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
8' x ¼" Niagara—NEW 1952

SLITTER
36" Pasco Slitting Line

STRAIGHTENER
No. 3 Medart 3 Roll, Capacity to 1½" Tubing

SWAGING MACHINES
#4 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 2¾" Tube 3¾" Solid 10"
Die Length Hydraulic Feed, LATE

TUBE MILL
Etna 1K Welded Tube Mill, Cut-off & Transformer capy. ½" OD 0.28 wall to 2" OD .120 wall

WELDERS—SEAM
200 KVA Progressive Universal, 220 Volt
400 KVA Federal Circular 440 Volt
500 KVA Federal Longitudinal 440 Volt

• Manufacturing

A. T. HENRY & COMPANY, INC.

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Equipment •

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

Constant Duty—3 phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	2500	Whse	CW	4600/2300	720
1	2500	G.E.	Mill	2300	240
1	1800	Whse.	Mill	6600/4000	270
2	1800	Whse.	Mill	2200	252
2	500	Al. Ch.	ARY	2300	505
1	500	G.E.	I-M	2300	450
1	400	Al. Ch.	ARY	2200	505
1	400	Whse.	CW	2200	230
1	350	G.E.	I-M-15B	2200	1180
1	350	G.E.	MT-412	2200	450
1	300	Whse.	CW 1012	2200	720
1	250	Al. Ch.	ARY	440	705
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-M	2200	1760
2	200	G.E.	I-17-M	2200	585
1	200	G.E.	I-14-M	2200	450
1	150	Al. Ch.	ARY	440/220	720
1	150	Whse.	CW	4160/2300	585
1	150	Whse.	CW-1009	440	435
1	100	Whse.	CW	440/220	1160
1	100	El. Dy.	EDX612	2300	900
2	100	G.E.	MT-562	440/220	570
2	100	G.E.	I-15A-M	2300	485
1	100	Al. Ch.	ARY	440	430

SYNCHRONOUS MOTORS

3 Phase, 60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	2400/4160	900
1	1500	Whse.	80	2300	514
1	920	G.E.	80	2200/440	300
1	710	G.E.	80	2300	720
1	450	Whse.	100	2200	128.5
3	350	G.E.	100	2300	900
1	300	G.E.	100	2300	720
1	300	G.E.	80	2200	600
2	300	G.E.	80	440	400
2	250	Whse.	80	440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300	360
1	150	G.E.	100	2200	900
1	150	Kl. Mchy	80	220	720
1	150	G.E.	100	550	600
3	135	G.E.	80	4000/2200	1200
1	125	G.E.	80	2200	300
2	100	Whse.	80	440/220	1800
1	100	Ideal	80	440/220	900
2	100	G.E.	80	440/220	600
1	100	El. Mchy.	100	440/220	360
2	50	G.E.	80	2200	600

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address: "Macsteel" Philadelphia, Pa.
Phone: Davenport 4-8300

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1150
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	300	Whse.	CW	440	514
1	350	Cr Wh.	Size 71	208-416	1765
1	350	G.E.	IM-17A	440-2200	720
1	250	G.E.	MT-424Y	1000	257
1	250	Cr Wh.	Size 290	2300	350
1	250	Al. Ch.		550	600
1	200	G.E.	IE13 B.M.	220-440	1760
1	200	G.E.	MT-557Y	220-440	1760
1	200	Cr Wh.	200B	440	595
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150	(unused) Whse.	CW	2300	435
1	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-559BY	440	3570
3	500	Whse.	CS-1216	2200	580
2	250	Whse.	CS-1420	2300-4150	554
1	400	G.E.	IK	2200	500
1	300	G.E.	KT-559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440-900	450
1	150	Whse.	CS856S	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Types	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501SL	4000-6900-13800	514
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2300	720
1	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200-12000	600
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220-440	900

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47 Howell Street, Jersey City 6, N. J.

CHECK THIS LIST FOR HIGH GRADE TOOLS

MISCELLANEOUS
Welder, 100 KVA Taylor Winfield
Welder, 50 KW Sciaky Dynatrol automatic, press spot
Threader, Model 1IS Rickert-Shafer nipple machine
Threader, 9 16" National precision thread roll
Threader, Type R Economy threader and pointer
Sloter, 36" Rockford hydraulic vertical, late MD
Shaper, 36" Rockford openside universal shaper-planer, mechanical
Roll, No. 1L Kane & Roach vertical bending
Roll, No. 1B Kane & Roach straightening
Planer, 30" x 30" x 8' Cincinnati, two rail, one side head
Lapper, No. 2 Cincinnati centerless, MD
Hone, No. 224-B Barnes hydraulic single spindle
Engraver, Model BL 2416 Pratt & Whitney Keller, 3 spindle
Compressor, 650 CFM Sullivan Class WJ-3 angle compound
Compressor, 390 CFM Ingersoll Rand type XRE, 2 stage
Cut-off, 6" capacity Campbell "Cutamatic" abrasive
Cut-off, No. 2A Modern automatic, late

SAWS
10½" x 10½" No. 3 Motch & Merryweather cold metal
10" x 10" Racine hydraulic shear cut
6" x 6" Peerless universal
6" x 6" No. 6 Marvel high speed

PRESSES
750 ton No. 3 National Maxi-press, all steel, forging, late
106 ton No. 78 Toledo S.C., overhanging, gap (two)
60 ton Henry & Wright high speed, dieing
50 ton Henry & Wright high speed, dieing (two)
95 ton No. 8 Bliss Consolidated OBI, MD
60 ton No. 600B Perkins, OBI
800 ton Model 2E48-800 Hamilton S.S., S.C., air clutch, late
113 ton No. 66 Bliss Consolidated S.S., tierod frame, DBG
106 ton No. 56 Toledo, S.S., S.G., tierod (three)
250 ton Williams & White 4 gost hydraulic
150 ton HPM Hydro-Power Fastraverse, hydraulic
100 ton HPM Hydro-Power hydraulic
350 ton No. 18T Cleveland double action, toggle drawing, S.C.
260 ton No.796⅝-72 Toledo double crank, toggle drawing
120-180 ton No. 174-S Toledo double action, toggle drawing, S.C.
200 ton No. 7 x 72" Bliss double crank s.s. tierod
126 ton Model 60D66 Cleveland s.s. double crank, tierod
600 ton No. 664 Toledo knuckle Joint coining

Write For Your List No. 206

MILES MACHINERY CO.

PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

W & W No. 2 Univ. Tube Bender, 1943.
Cinn. 10' x ⅜" Squaring Shear, 1937.
Cinn. 4' x ¼" Press Brake, New.
B & S No. 2B Surface Grinder, 1949.

D. E. DONY MACHINERY CO.

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NEW BATH PRESS BRAKES

10' x ¼"	No. 150-10,	150 ton,	12' bed
10 x 3/16"	No. 120-10,	120 ton,	12' bed
10' x 8 ga	No. 100-10,	100 ton,	12' bed

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1222

5' x 10 ga. Parker Power squaring shear, 1947, M.D.

No. ½, No. 1½ Buffalo Forge Univ. Ironworkers, Coper, Notcher, M.D.

FALK MACHINERY COMPANY

16 Ward St. Baker 5887 Rochester 5, N. Y.

CALL Curry! FOR SURPLUS STEEL PLANT EQUIPMENT

AVAILABLE EQUIPMENT

1—**Propane Gas Plant, 60,000 Gallons Storage Capacity,** complete with Pumps, Valves, Heat Exchangers, etc.

1—**Steel Frame Building, 145 ft. Wide x 1,060 ft. Long, 2 Bays,** complete with Six 10 Ton DC Cranes

1—**36" Wean Slitting Line**—Capacity 5 Cuts in 3/16" Material, complete with Uncoiler, Slitter, Recoiler, and Misc. Spare Parts—New 1946

Write for the Curry List of available steel plant equipment

1—**2000 H.P., G.E. Slip Ring Motor** for 3 Phase, 60 Cycle, 2200 Volt Current @ 237 RPM, complete with Controls

1—**2000 H.P. Mesta Gear Reduction Unit** Ratio 10 to 1.

ALBERT Curry & CO. INC.
STEEL PLANT EQUIPMENT
941 OLIVER BUILDING · PITTSBURGH 22, PENNA.
Phone ATlantic 1-1370

1—**12" 3-Stand 3-Hi United Bar Mill—Top and Bottom Screw,** complete with Pinion Stand and driven by 750 H.P. Motor, 230 Volt DC

1—**144" x 3/16" Stamco Power Squaring Shear,** complete with Holddown

1—**40 Ton Morgan Ladle Crane,** 50 ft. Span DC Current

1—**#4 United Sheet Bar Shear, 26" Knives,** complete with 30 H.P. DC Motor and Tables

1—**500 H.P. Mill Drive,** consisting of a 500 H.P. G.E. Synchronous Motor 327 RPM, and a 500 H.P. Farrell Birmingham Reducer, Ratio 10 to 1.

Cable Address: CURMILL-PITTSBURGH

2000# Chambersburg Pneumatic Forging Hammer Late Type, Serial 20CH392L7.
4000 lb. Chambersburg Double Frame Steam Forg. Hammer
2500 lb. Erie Single Leg Steam Forg. Hammer
No. 7 Ajax Forging Press, 700-ton capacity
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
25 Transformer and Generating Arc Welders
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' P. & W. Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
Conomatic, 8 Spin. Cap. 1⅝" Rd.
Conomatic, 4 Spin. Cap. 1½" Rd.

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

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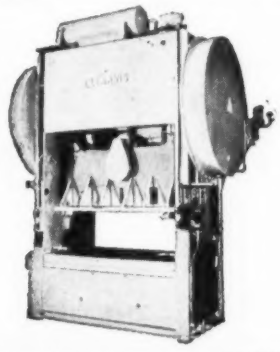

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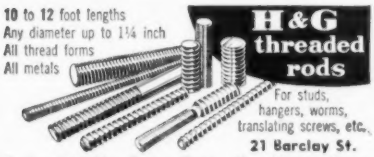

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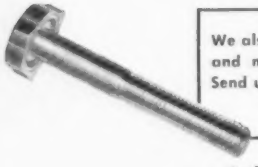

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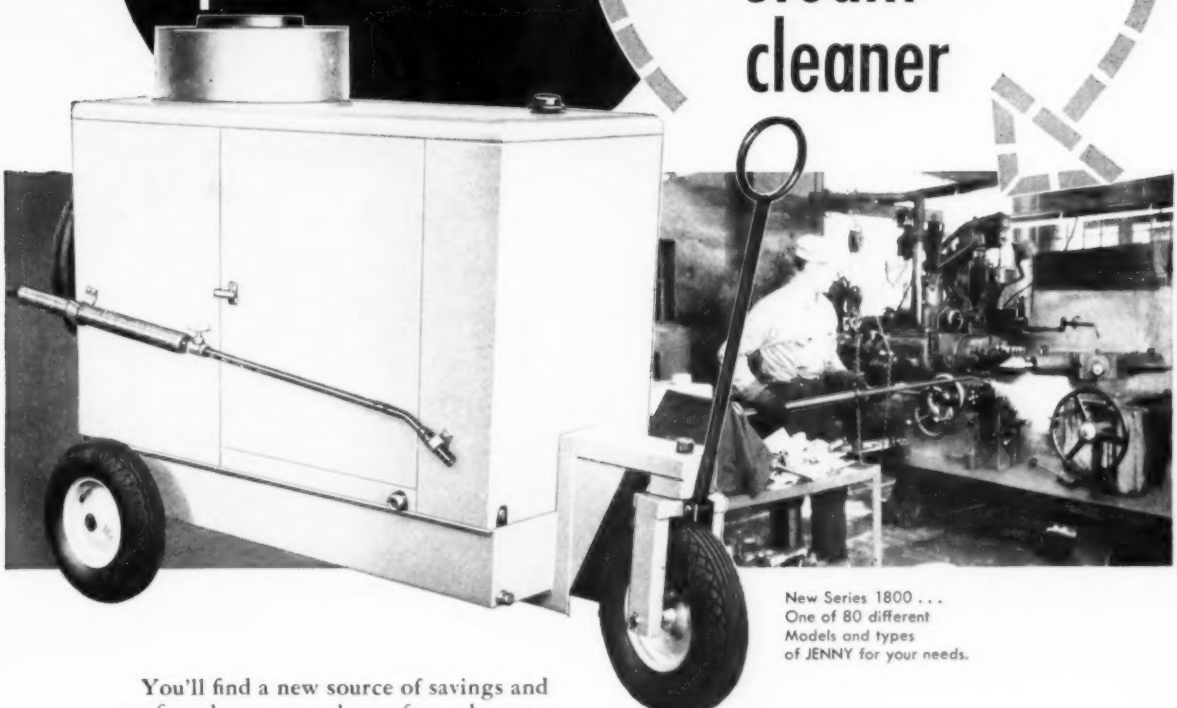

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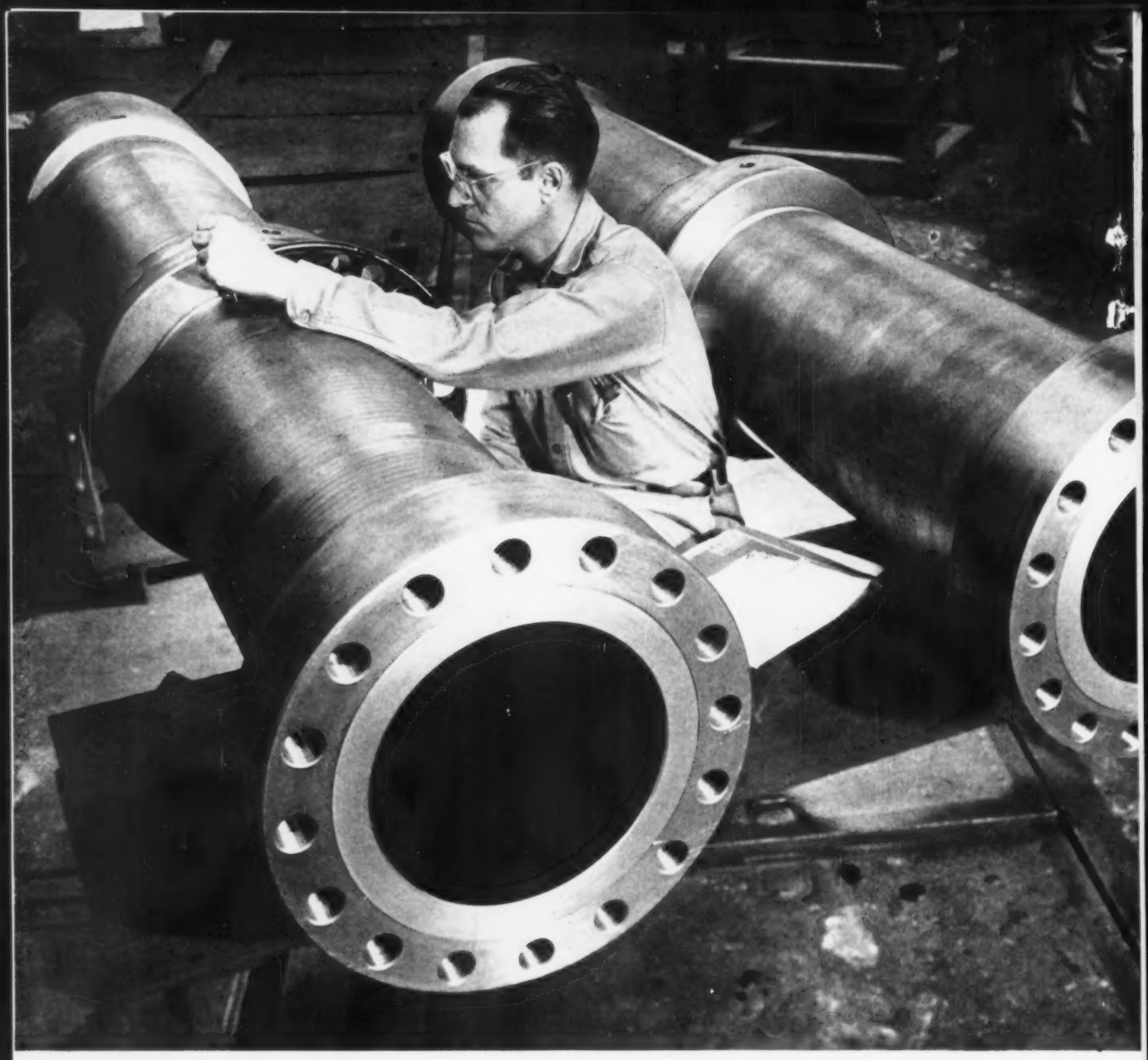

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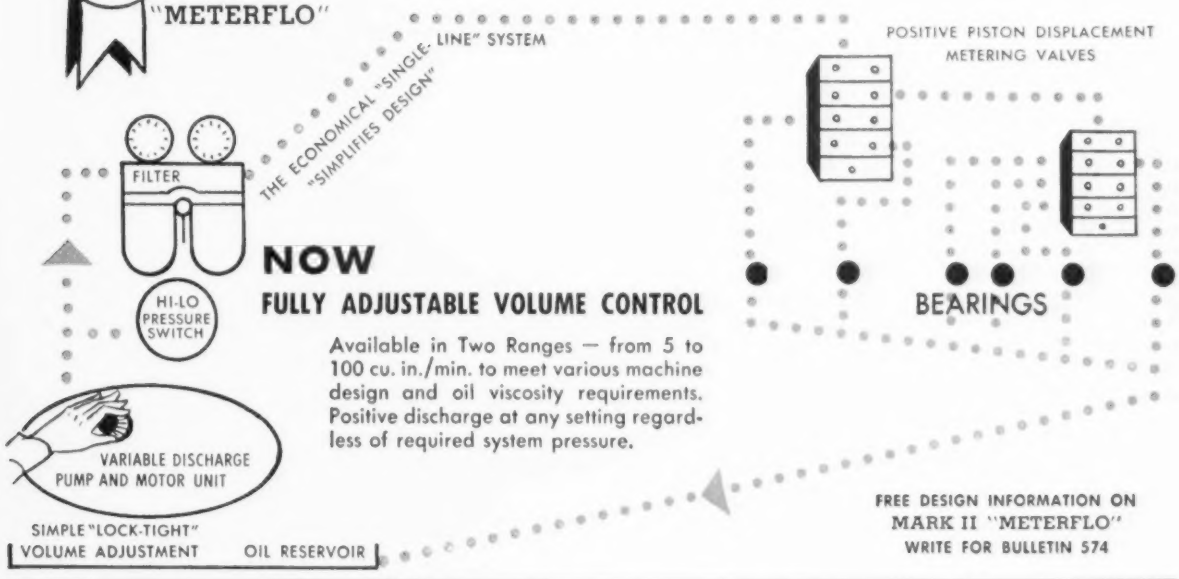

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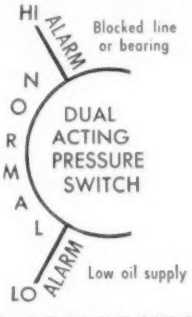

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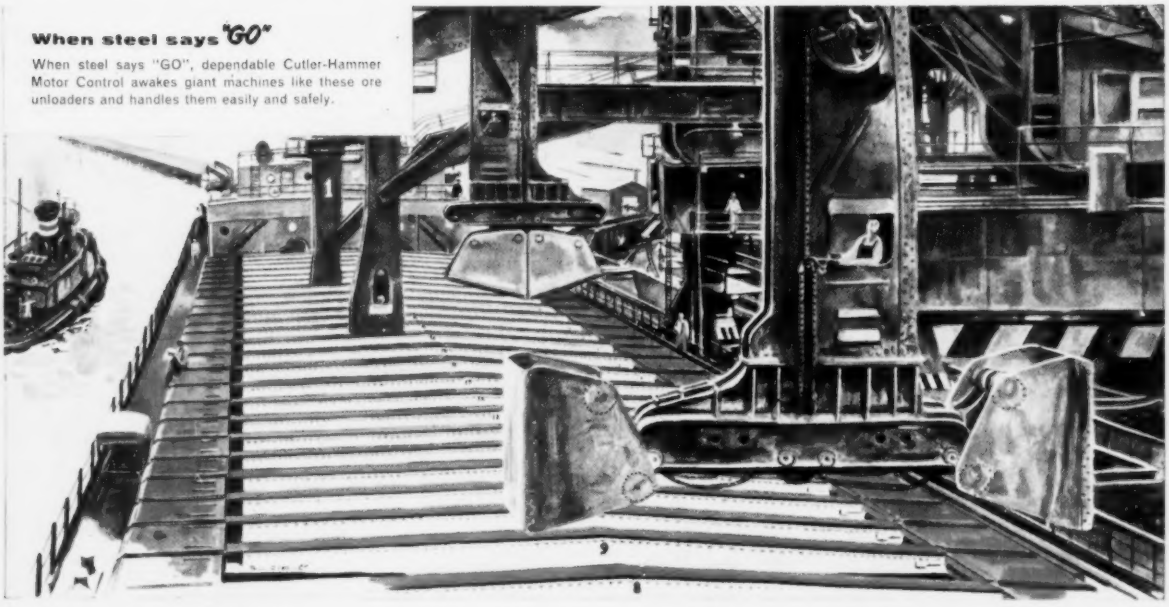

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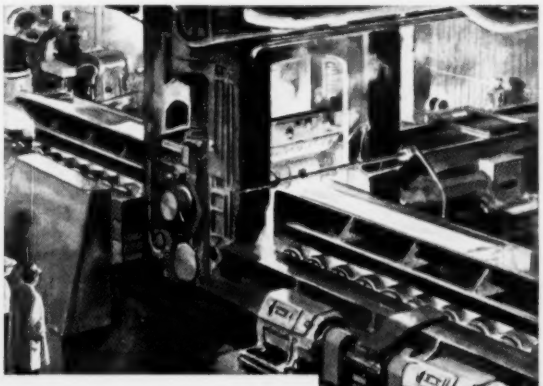

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